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1409 EMIL STREET, PO BOX 9538, MADISON WIS 53715 • TEL (608) 267-4848

July 29, 1980 C 9177

Mason & Hangar-Silas Mason Company, Inc. P.O. Box 1316 Edison, New Jersey 08817

Attention: M.L. Sproul

EERU Manager

Re: Subsurface Investigation Outboard Marine Corporation

Waukegan, IL

Gentlemen:

We are pleased to submit three (3) copies of our report and associated Drawing describing the subsurface investigation performed at the Outboard Marine Corporation Facility in Waukegan, Illinois. Thank you for contacting us with regard to this investigation. If you should have any questions or desire further clarification, please feel free to contact us.

Very truly yours,

WARZYN ENGINEERING INC.

Robert J. Karnauskas

Hydrogeologist/Project Manager

RJK/dkp

Encl: as stated

SUBSURFACE INVESTIGATION NORTH DITCH AREA OUTBOARD MARINE CORPORATION WAUKEGAN, ILLINOIS

INTRODUCTION

The results of the subsurface investigation performed at the Outboard Marine Corporation - Johnson Division (OMC) property in Waukegan, Illinois are presented in the following report. The investigated area is located in portions of the soutwest 1/4 and the southeast 1/4, Section 15, and the northwest 1/4, Section 22, Township 45 North, Range 23 East, Lake County, Illinois. The site is bounded on the east by Lake Michigan, on the south by Waukegan Harbor, on the west by the Chicago and Northwestern railroad tracks, and on the north by the Northshore Sanitary District property. This investigation was undertaken to provide the Environmental Protection Agency, Region 5 with information concerning possible contamination of soil and groundwater by industrial related wastes (PCB). This study was performed under contract to Mason and Hangar-Silas Mason Company, Inc., Edison, New Jersey.

SCOPE

The subsurface investigation consisted of 39 soil borings ranging in depth from 25' to 35', five soil borings to a depth of 6', the installation of seven groundwater monitoring wells, and 20 six foot long sediment cores from the north ditch. All soil samples collected were handled in accordance with Chain of Custody procedures and delivered to Raltech Scientific Services, Madison, Wisconsin, on a weekly basis.

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All wells and soil borings were located to a horizontal accuracy of $\frac{+}{2}$ feet. The vertical elevations of the tops of all borings and well casings were determined to an accuracy of $\frac{+}{2}$ 0.1 feet. Appendix G contains boring and well location and elevation data. Field permeability tests (baildown tests) were performed on all wells installed.

To minimize the potential for cross contamination of samples, all drilling equipment coming into contact with soils was cleaned with acetone between borings. All sampling devices were cleaned with acetone between samples. The potential for encountering harmful substances in the subsurface soils, necessitated the use of extensive protective clothing for all personnel coming into contact with the drilling equipment. Excess soil cuttings and used clothing were disposed of in DOT approved 55 gallon drums for later disposal. Photos are available which document the procedures.

DRILLING PROCEDURE

Two rotary drill rigs were employed during most drilling operations. Six of the sediment cores from the north ditch were obtained by using a tripod rig mounted on a small barge. Logs for all borings, sediment cores and monitoring wells are presented in Appendix C. Drawing C 9177-1 shows the locations of all drilling sites.

A. Soil Borings

Thirty-nine soil borings to a depth of between 20 and 35 feet, and five borings to a depth of 6 feet were performed. The deepest borings were terminated upon entering an underlying, gray, clayey silt layer. Sand and sand and gravel soils were encountered above the silt. In the deeper borings soil samples were taken at the surface and every 5' thereafter.



The deepest soil sample was taken upon contact with the silt layer. In the six foot borings samples were obtained at the surface, at three feet and at six feet.

A combination of hollow stem flight augers and washboring methods were used for drilling operations. Hollow stem flight augers, in 5 foot sections, were advanced into the ground and the soils materials washed from the hole to the appropriate depth for splitspoon sampling. Potable water used in drilling was obtained from the OMC plant. All recirculated drilling water recovered was collected and processed in a portable water treatment plant, maintained on-site by Mason & Hangar-Silas Mason Co. Inc.. Soils removed from the hole, except for the samples, were disposed of in Department of Transportation (DOT) approved 55 gallon drums. Boreholes were backfilled using clean flint sand, similar in permeability to the native soils.

To minimize potential for contamination of soil samples with foreign material, all drilling tools and equipment entering the borehole or coming into contact with equipment entering the borehole, were cleaned in acetone between borings. To help in the removal of soil particles from the drilling equipment, brushing and/or hosing with water was used as necessary prior to acetone rinsing. Prior to mobilization onto OMC property, the drill rigs and all associated equipment were steam cleaned to remove dirt and grease. Petroleum or hydraulic products were not allowed to come into contact with drilling equipment going into the bore hole. A synthetic, PVC-free grease (Molykote 33) was used as substitute for petroleum greases usually used during drilling processes.

Sampling equipment was cleaned with acetone between each sample, to minimize the potential for intra-sample contamination.



E. Monitoring Wells

Five watertable wells and two piezometers (M12 and MW3) were installed. Well construction details are presented in Appendix D.

The water table wells were constructed with 2" ID type 304 stainless steel pipe attached to 2" ID 5' stainless steel well screens with stainless steel couplings. The top of the well screen was set at or near the water table at each water table well installation.

The piezometers (MW2 and MW3) were installed for the purpose of determining vertical gradients in the groundwater flow system and for water quality monitoring at depth in the groundwater system. The piezometers were constructed of 2" ID stainless steel pipe attached to 2" ID 2' stainless steel screens at depths of approximately 15 and 25 feet.

Monitoring wells were installed by advancing bore holes to the desired depth, and then installing the instrumentation. Soil samples were collected at the surface and at 5' intervals for all water table wells. The bore holes at the piezometer nest (MWI, MW2 and MW3) were sampled in such a manner that samples were obtained by splitspoon methods at 5' intervals to the depth of the deepest well. All procedures described in the previous section, with regards to minimizing of potential contamination of the bore hole and samples, were followed during drilling for monitoring well installation. Boring logs for monitoring wells MWI - MW7 are presented in Appendix C.

The stainless steel pipes were cleaned by inserting an acetone soaked cloth through the pipe and by spraying acetone into the inside of the pipe. The outside of the pipes were cleaned by spraying directly with acetone and wiping with an acetone soaked cloth. Special attention was given to the threads of the well pipes to remove any cutting oils. The



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couplings received similar attention. Well points were cleaned in a manner similar to the stainless steel pipe. Locking protective casings were installed, and cemented into place, for each monitoring well. These protective casings were cleaned on the inside and the outside with acetone. Molykote 33 grease was used to grease well caps and protective casing caps.

After cleaning all stainless steel components of the monitoring wells, the wells were assembled and placed in the borehole. The well screens were backfilled with flint sand to about 1' above the well screen. Piezometers had 3' bentonite pellet seals placed above the sand pack. Backfill consisted of clean sand and/or borehole cave-in material. No spoil material was returned to any of the boreholes. Two to three foot bentonite seals were placed in the annular space to ground surface at all monitoring wells.

C. Sediment Cores

Twenty continuous sediment cores of approximately 5' to 6' in length were collected from the north ditch. Sediment core locations are shown on Drawing C 9177-1.

Continuous cores were obtained by pressing a length of 2" ID stainless steel pipe to a depth of 6' below the top of the trench sediments (except SC-1 which was obtained by split spoon). The top of the pipe was then sealed and the pipe was pulled from the sediments. To minimize loss of the sediments from the bottom of the pipe, a member of the drill crew using acetone cleaned gloves, placed his hand over the bottom of the pipe before the pipe was pulled completely out of the water. At 14 locations the stainless steel pipe was manipulated using an all terrain drill rig on crane pads laid across the channel. At six locations (SC7, - SC12) the trench was too wide to allow the placing of crane pads across it.

Consequently, a small barge with a tri-pod and a small portable motor with a "cat head" was used to drive and remove the stainless steel sampling pipe.

Samples were collected by tapping the outside of the pipe to shake the sediments loose, allowing the sediments to flow into sample jars. Each sample represents approximately 6" of soils material. The stainless steel sampling pipe was thoroughly cleaned with acetone inside and out between sediment cores.

SAMPLE HANDLING PROCEDURES

Soil samples obtained from borings, monitoring wells and soil cores were contained in 32 oz. glass sample jars supplied by U.S. EPA.

Aluminum foil was placed over the jar opening before sealing with a screw cap. Labels were provided indicating boring number, sample number, depth, etc.

The soil samples from drillling locations BlO, 623, SCl, SC3, SC5, and SCll were placed in an insulated container with dry ice immediately after collection, to preserve volatile organics present. The samples were delivered to the lab in a frozen condition.

Between each sample, the split spoon sampler was washed and brushed in water to remove any residual soils material. The split spoon was then immersed in acetone. After removal from the acetone bath the sampler was again sprayed with acetone. All samples were collected by drill rig chiefs and maintained in their possession under Chain of Custody procedures (Appendix F) until they were signed over to the field custodian. The field custodian followed Chain of Custody Procedures for delivering the samples to the laboratory.



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FIELD BAILDOWN TESTS

Baildown tests were performed on the installed monitoring wells to determine subsoil permeabilities. The baildown tests consisted of pumping down the water level inside each well with a 3-horse power gas driven pump and subsequently measuring the recovery of the water level to the static level over time. Depth to water was measured in the wells during the test with a fiberglass measuring tape with an attached "sounder". The time that lapsed during the test was recorded with the use of a watch. The results of the baildown permeability tests are presented in Appendix E. Additional data and methods of reduction are included in Appendix E.

The outside of the hose used for pumping out the wells, the tape, and "sounder" used for measuring water levels were acetone cleaned before being introduced into the well. All water pumped from the wells was collected for processing at the portable water treatment plant. The hose was removed from the well while still pumping so that water having come into contact with the inside of the hose would not be re-introduced into the well after pumping was terminated.



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CLOSING REMARKS

We trust this report and the information contained herein is sufficient for your present needs. If you have any questions or desire further information, please feel free to contact us.

Respectfully submitted,

WARZYN ENGINEERING INC.

James A. Hill

Project Geologist

Robert J. Karnauskas, Hydrogeologist

Project Manager

Daniel R. Viste, CPGS

Sr. Adviser/Associate

JAH/RJK/DRV/amh

Encl: See Attached Appendices



APPENDIX A

Subsurface Investigation - General Remarks
Field Methods for Exploration and Sampling Soils



Subsurface Investigation

GENERAL REMARKS

We have endeavored to evaluate subsurface conditions and physical properties of the subsoil as revealed by the borings and laboratory testing. A problem inherent in this evaluation is the variability in engineering properties within soil strata involved, and specifically in any location variation in the soil which is located between borings. Due to natural or man-made causes, subsurface conditions may change with time.

Conclusions drawn and recommendations given in this report are for a specific proposed use of this site. They are our opinions and are based upon conditions that existed at the boring locations and such parameters as proposed site usage, soil loading, elevations, etc..

Since subsurface conditions depend on seasonal moisture variations, frost action, construction methods, and the inherent natural variations, careful observations must be made during construction. These should be brought to our attention as it may be necessary to modify the conclusions and recommendations presented herein.

FIELD METHODS for EXPLORATION AND SAMPLING SOILS

A. Boring Procedures Between Samples

The bore hole is extended downward, between samples, by a continuous flight auger, driven and washed-out casing, or retary boring with drilling mud or water.

B. <u>Standard Penetration Test and Split-Barrel Sampling of Soils</u> (ASTM* Designation: D 1586)

This method consists of driving a 2" outside diameter split barrel sampler using a 140 pound weight falling freely through a distance of 30 inches. The sampler is first seated 6" into the material to be sampled and then driven 12". The number of blows required to drive the sampler the final 12" is recorded on the log of borings and known as the Standard Penetration Resistance. Fectivered samples are first classified as to texture by the driller. Later, in the laboratory the driller's classification is reviewed by a soils engineer who examines each sample.

C. Thin-walled Tube Sampling of Soils (ASTM* Designation: D 1587)

This method consists of forcing a 2" or 3" outside diameter thin wall tube by hydraulic or other means into soils, usually cohesive types. Relatively undisturbed samples are recovered.

D. Soil Investigation and Sampling by Auger Borings (ASTM* Designation: D 1452)

This method consists of augering a hole and removing representative soil samples from the auger flight or bucket at 5'0" intervals or with each change in the substrata. Relatively disturbed samples are obtained and its use is therefore limited to situations where it is satisfactory to determine approximate subsurface profile.

E. <u>Diamond Core Drilling for Site Investigation</u> (ASTII* Designation: D 2113)

This method consists of advancing a hole in hard strata by rotating downward a single tube or double tube core barrel equipped with a cutting bit. Diamond, tungsten carbide, or other cutting agents may be used for the bit. Wash water is used to remove the cuttings. Hormally a 2" 0.D. by 1 3/8" I.D. coring bit is used unless otherwise noted. The rock or hard material recovered within the core barrel is examined in the field and laboratory. Cores are stored in partitioned boxes and the length of recovered material is expressed as a percentage of the actual distance penetrated.

^{*}American Society for Testing and Materials, Philadelphia, Pennsylvania

APPENDIX B

Log of Test Boring - General Notes
Unified Soil Classification System Sheet



LOG OF TEST BORING



General Notes

Descriptive Soil Classification

GRAIN SIZE TERMINOLOGY

60	AIN SIZE TERMINOLOS	U.S Standard Sieve Size
	. in Cite	Carner than 12"
Soil Fraction	Larger than 12"	3" 10 12"
	Particle Size Larger than 12" 3 to 12" 3,2" to 3" 4 76 mm to 3,2" 2 00 mm to 4 76 mm	
Grave: Con	and we to tie we	24 01 04
	0 1 100	LAN FIU
Sill	paristics differentiate batween	1 •··· -
Plastici	Smaller than 0.005 mm. Smaller than 0.005 mm. Ity characteristics differentiate batweer	TIVE DENSI

GENERAL TERMINOLOGY

Physical Characteristics Color, moisture, grain shape, fineness, etc. Major Constituents Clay, silt, sand, gravel Laminated, varved, fibrous, stratified. Structure cemented, fissured, etc. Glacial, alluvial, colian, residual, atc. Geologic Origin

RELATIVE DENSITY

	"K" Asine	
Term	0.4	
Asid Fooss	4-10	
1 0058	10.30	
Medium Dense	30.50	
Nedinu Deuze	Over 50	
AsiA Deuze	. '	

RELATIVE PROPORTIONS OF COHESIONLESS SOILS

OF COHES	Defining Range By
Proportional	Percentage of Weight
Term	12%
Fillis	35% 50%
Some	35%-50%
And	•

CONSISTENCY

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Satt	n 50 to 1.0
Medium	10 10 20
Sull	an te ^{a u}
ASLA ZIIII	Dver 4.0
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ORGANIC CONTENT BY COMBUSTION METHOD

COMBUSTION	
Soil Description Non Organic	Land than A Co
Oceanic	4.12*
May night City	12 505
Non Organic Organic Sitt/Clay Sedimentary Peat Fibrous and Woody Past	More than 509

PLASTICITY

PLASTI	c Index
None to Stight	5.7
Slight	B-22
Medium	Dvet 22
Medium High	

The penetration resistance, N. is the summation of the number of blows required to effect two successive 6° pentiations of the 2° split-barrel sampler. The sampler is driven with 8 140 lb. weight dalling 30" and is sealed to a depth of 6" before commencing the standard penetration test.

Symbols

DRILLING AND SAMPLING

CS-Continuous Sampling RO- Pote Cornt Size AN EW, NW. 2" W ROD-Rock Cuarris Designator RB-Rock Bit FT-Fish Tail DC-Drove Casing C-Casing Size 212", NW. 4 HW CM - Cles. Mais. DIA-Drilling Mus HSL-Hollow Stem Auge: FA-Fright Auger HE-Hand Luger COY-Cissu Or, Vaces SS-2 Diameter Split Earrer Sample 257-2' Diamete. Thin Waller Tube Sample 357-3 Diameter Trin Walted Tube Sample PT-3 Biameter Piston Tube Sample ES-Luper Sample WS-Wash Sample PTS-Peat Sample PS-Filting Sample NR-No RECOVERY PMT - Borencie Pressuremeter Test S-Sounding VS-Vane Shear Test WPT-Water Fressure Tes:

LABORATORY TESTS

c.-Penetrometer Reading, tons/sq ff a.-Uncontined Strength, tons/sq. ft. W-Moisture Content. % LL-Liquid Limit. PL-Plastic Limit. % SL-Shrinkage Limit. 5 LI-Loss on Ignition. D-Dry Unit Weight, 165 /cm ft pH-Measure of So Alkalimity or Acidity FS-Free Swell, S.

WATER LEVEL MEASUREMENT

-- Malei Fenel at time zyomu N.W.-No Water Encountered WD-While Drilling BCR-Betore Casing Removal ACR-After Casing Removal CW-Caved and Wet CM-Caved and Moist

Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.



UNIFIED SOIL CLASSIFICATION SYSTEM

COARSE GRAINED SOILS

(More than half of material is larger than No. 200 serve size)



Clean Gravels is the or no times

GW	Ase., č.9060		grave" sand	m:
• • • •	tures with or	no tines		

Poorty praded pravets cravet sand mix-tures little or no tines GP

Gravels with Fines. Appreciable amount of fines.

 $GM \frac{d}{u}$. Stilly grave is grave, sand sitt mixtures

GC Claves cravers grave sand clay mistures



Clean Sands (Little or no fines)

SW	Well graded sand: no lines	s pravers sands	the or

Poorly graded sands, gravety, sands, little or no tines

Sands with Fines (Appreciable amount of lines).

SM d Silly sands sand sill mixtures

SC Cravey Sands, sand clay mixtures

FINE-GRAINED SOILS

(More than half of material is smaller than No. 200 sieve.)



- Inorganic silts and very fine samps rock flour silty or clayey fine samps or clayey silts with slight plasticity
- Inorganic clavs of tox to medium plastici Ty gravelly clavs, sandy clays, silly clavs, lean clays.
- Organic sets and organic sittly class of low OL DIASTICITY



- Inorganic sitts, micaceous or diatoma MH ceous fine sandy or sifty soils elastic sills
- CH Inorganic clavs of high plasticity fat clays
- Organic cravs of medium to high plasticity organic sills



PT Peat and other highly organic soils

LABORATORY CLASSIFICATION

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SC

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Liquic Limit

For classification of fine plained soils and fine fraction of coarse grained soils.

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Equation of A line Pt = 0.73 (LL 20)

APPENDIX C

Logs of Test Boring



WARZYN

ENGINEERING INC

LOG OF TEST BORING

Project	Subsurt	face Inv	vestigation
			Corporation
Location	Maukes	gan, III	linois

Boring No 1 6-1
Surface Elevation
Job No 0, 9177
Sheet 1 of 1

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NYZH
TERING INC

LOG OF TEST BORING

Subsurface Investigation Project Gutboard Marine Corporation

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Sneet of 1	

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WARZYN

ENGINEERING INC

LOG OF TEST BORING

Project	Subsurface Investigation
	Outboard Marine Corporation
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					<u> </u>	End Boring at 30'		
					-			1
					E		\\	
				 	35-	* GRAVEL Some Fine to Coarse Sand		·
			1		F			
					E	** Gray SILT, Trace Clay, Trace Sand		
					<u> </u>			
					40 -	1		
_	 -		<u> </u>	/AT	ER	LEVEL OBSERVATIONS	GENERAL	NOTES
W	While Drilling 26" Start5/30/80 Pannlete5/3						m 1 5 "	
Ur	Upon Completion of Drilling Crew Chief Rig. 750							750
	me Afi			9 -			Drilling Method Hollow Stem A	
1	pth to			-			INCLION SEEM W	uye'

VVAHZYIV

ENGINEERING INC

LUG UT IESI BUHING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No B	- 4
Surface Elevation	582.8
Joe No C 9177	
Sheet 1 of]

__1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS | 53715 + TEL. (608) 257-4848_

SAMPLE						VISUAL CLASSIFICATION	SOIL PROPERTIES							
	Recovery Mois		ture		and Remarks									
No.	Type	•	7	N	Depth	1	Qu i	' W		PL	D			
7	SS	<u>X</u>	M	8										
	i <u>i</u>				<u>-</u>	Brown & Gray Fine to Medium SAND, Trace to Little Silt, Slightly Organic								
2	: ccı	χ	1.7	22	Ξ	to Electe Stit, Stightly organic			-					
	33			1	- 5 –			.						
	i		:		Ξ	Plack Fine to Madium SAUD Turns to Litable								
						Black Fine to Medium SAND, Trace to Little Silt and Clay								
3	SS;	<u> X</u>	W	8	- 10-			· 	1	:				
					=			<u>.</u>	:	: :				
			. 						1					
4	SS		W	26	=				!					
			1	1	± 15-	Gray Very Fine to Medium SAND, Trace			 -	:				
					-	to Some Silt, Scattered 2" to 4" Layers Sandy Silt with Shells, Some Organic			i	· · ·				
	-				-	Material			 -					
5_	SSI	<u> </u>	W	24	<u>-</u> 20 -				<u> </u>					
ļ				•					1	! i				
					<u> </u>			 	<u> </u>					
6_	SS	X	W	12	<u>-</u> 25 -				<u>:</u>					
					E				;					
									;					
7	+		W	16	=======================================		4.0		;	. ;				
 	SS	<u> X</u>	W	10	F 30 -	Gray SILT, Trace Clay, Trace Sand	4.0							
					E	End Boring at 32'			!	:				
			ļ	<u> </u>	<u> </u>	End Boring at 32								
<u> </u>		- -	<u> </u>	<u> </u>	- 35 -		<u> </u>		 					
			 		Ē									
					E				i	;				
					E 40			 						
			1	/^-		TEVEL OBSERVATIONS	C	NER		NICT				
WATER LEVEL OBSERVATIONS						 								
While Drilling 19"						Star	St. [v Chief	ennis	plete	/21/80 750				
Upon Completion of Drilling						1	ng Me			• • • • • • • • • • • • • • • • • • • •				
Į.	epth to			-				110w						
Courte to Cave In						{				- 3				

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No 8-5.	
Surface Elevation	
Job No. C. 9177	
Sneet	.1

____1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS 53715 + TEL. (608) 257-4848_

SAMPLE	VISUAL CLASSIFICATION	SOI	LP	ROF	ERT	IES
Recovery Moisture	and Remarks				;	
No. Type v . v N Depth		Qu ,	W	ll	PL	D
1 SS 1'4" 11 11 F	To B Con Mar File Con T					
i -	Tan & Gray Very Fine to Fine SAND, Trace Silt, and Clay			;		
2 SS X W 17 = 5	Soil Gray Only	:		:		
				-		
<u> </u>		!		<u>!</u>		
	6" Lavon Chave Chave Sand				- -	
3 SS 7" W 28 - 10	6" Layer Gravel, Coarse Sand			<u> </u>	<u>:</u>	·
				ı	;	į
				!		,
	,			-	!	!
4 SS 1' W 13 F 15				<u> </u>	-	<u>;</u>
				İ	:	
				į	1	:
5 65 71415 11 20			-			, !
5 SS 1"4" W 29 = 20				<u> </u>		
	Lighter Grav					
	,			!	ļ	<u> </u>
6 SS 1'5" W 31 F 25				i	1	<u> </u>
0 33 1 5 W 31 F 25	- 		<u></u>	1		! !
				:	;	: •
				!	:	<u> </u>
7 SS 1'2" W 42 = 30	*	1		į		-
8 SS 11'1' M 100 = 30	Gray SILT, Trace Clay, Trace Sand				i	
	End Boring at 31'6"			<u> </u>	i	!
	2 20 3 20 0. 0				: :::-	
35				ļ - l -		
E 33	* Gray Very Fine to Coarse SAND, Trace to			!	•	
	Little Silt and Clay, Trace Gravel			1	1	!
		 		1	-	<u> </u>
	4	 		. !	<u> </u>	
WATER	LEVEL OBSERVATIONS	GF	NFF	RAI	NO.	TES
While Drilling					/22/80 55-1	
Upon Completion of Drillin Time After Drilling 14 ht		1			_	
Time After Drilling 1/4 https://doi.org/10.1006/10.00006/10.0006/10.0006/10.0006/10.0006/10.0006/10.0006/10.0006/10.0006/10.00	Drilling Method Hollow Stem Augen					
Depth to Cave In .					J = .	

HZYN

LOG OF TEST BORING

Subsurface Investigation
Outboard Marine Corporation Location Waukegan, Illinois Boring No. B-6 Surface Elevation

Job No. (19177)

- F	3,70,60	Sheer
	Location Waukegan, Illinois Location Waukegan, Illinois TREET - P.O. BOX 9538. MADISON. WIS. 53715 - TEL. (608	
	WOUNCE (608	257-4848
	Location wis 53715	SOIL PROPERTIES
NEERING INC	9538 MADISON.	PROPERTIES
NEEHING	TREET . P.O. BOX 350	SOIL
1409 EMIL 5	VISUAL CLASSIFICATION	D. W. LL. PL. D
	- A SSIFICATION	I w II PI
	CLASSIII	qu W II
- ANDLE	VISUAL CLARA	
SAMPLE	and Rein	
Maisture		
tecovery Moisture	Tan Very Fine to Medium SAND, Trace Silt	
H Depth	Medium SANU, IT	
Abs 4 4 H Debut	T- vary fine to med.	
Y M	Tan very	
5 X M		
<u></u>	Gray Very Fine to Fine SAND, Trace Silt	
	to Fine SANU, "	
375	Very Fine to 1	
1 cc x W - 3/ !	5 T Gray 127	
53-1	and Clay	
<u> </u>	•	
W1 32 F	Gray Very Fine to Medium SAND, Trace S Gray Very Fine to 1/4" Seams Black Fir	ilt,
3 SS X	Gray Very Fine to Medium SAND, Trace of Gray Very Fine to 1/4" Seams Black Fire Scattered 1/8" to 1/4" Seams Black Fire Scattered 1/8"	
	Fine to Medium Same Black Fir	
	- I Gray Very 1/0" to 1/4" Seams	
	- ccattered 1/0	
	1 30000	
	- 15 - Sand	
4 SS X W 20	F10	
	Gray Very Fine to Fine SAND, Trace to	o Some
	Fine SAND, ITace	
	Wary Fine to Then Black	
	-E Gray Very Clay, Streaked	
1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	Gray Very Fine to Fine Sallo, Gray Very Fine to Fine Sallo, Silt and Clay, Streaked Black	
5 SS X W 3	20 7 -	
5 133 12	<u> </u>	
	Coccasional Shells	
	F loccasional Shells	
	_F OCCUSA	
	30 - 25 - Sand Some Large Grave	
F ISS X W	30 = 25 -	
0 SS 1X		
7 1 1	Layer Coarse Sand Some Large Grave	1 29'2'
	- come Large Grove	
	- Charse Sand Sollie	
	Layer cour	
- V W	27 = 30 to 30'	4.5+
7 155 X	Trace Sand	
	Gray SILT, Trace Clay, Trace Sance Find Boring at 33.5'	
	Gray SILT, Trace Clay, End Boring at 33.5'	
	End But IIIs	
8- SS X-		
	T 上	
 	I F I	
!		GENERAL NOTES
 	1 = 1	GENERAL 6/2/80
		5/2/80 complete
T	1 - 10-1 - SCEDVATIONS	Start C+ Dennis 750
	WATER LEVEL OBSERVATIONS	GENERAL NO. 2 Start 6/2/80 complete 6/2/80 Start St. Dennis 750 Crew Chief Rig 750
	WATER LEVE	Drilling Method
1	VVAI	Drilling Method Auger
	37"	Drilling Method Hollow Stem Auger
1 national		- $ 1.199.73$
(While Drilling	Dietion of Drilling	
1 - comp	DIECIO	
Time After	Drilling	
Time Aile	19185	
Denth to V	Valet	
' ' ' ' '	nie In	
	·	•

WARZYN

ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring (Vo B	-7
Surface Elevation	
Job No. C 9177	
Sheetl of	

___1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848_

SAMPLE			VISUAL CLASSIFICATION		SOIL PROPERTIES							
	Reco	very	y Moisture			and Remarks				<u> </u>	!	
No T					Depth	i ·	Qu	; W	, 11	PL	. 0	
	<u> </u>	1	-11	17	<u>-</u>	Tan Very Fine to Medium SAND, Trace Silt						
2 9	SS	1 4 1	_ W	10	<u>-</u> - 5 -	and Clay		:	:	i		
3 9	 SS	0"	W	13						· 		
		-				Gray Very Fine to Fine SAND, Trace to Little Silt and Clay Occasional Coarse Sand, Gravel			i			
4 5	SS	х	W	31	15-	į				<u> </u>	!	
5 5	SS	1 '3"	W	50							<u> </u>	
6 5	ss .	X	W	24	25-							
7 5	S	ין'	W	23	30	GRAVEL Some Fine to Coarse Sand						
8 S	S	χ	W	103	Ė	Gray SILT, Trace Clay, Trace Sand	4.5+	,	!	:		
					11	End Boring at 33'6"	4.5+					
					E 40-				<u> </u>	!		
WATER LEVEL OBSERVATIONS						GE	NEF	RAL	NO	res		
While Drilling					Star Crev Drillin	/22/8 v Chie	80 Cor f JWG	nplete	5/22/80 .55-1			

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No B-8
Surface Elevation 585.3
Job No. C. 9177
Sheet lof

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS 53715 + TEL. (608) 257-4848_

SAMPLE			Ε		VISUAL CLASSIFICATION	SOIL PROPERTIES						
	Reco	ery	Mais	ture		and Remarks			1.1			
Nc.	Type	•	₹	N	Depth		Q.	: w	LL	Pί	D	
	SS	X	11	6	<u>-</u>	FILL: Tan & Gray Mixed Fine to Medium SAND, Trace Silt,		!				
	SS	Χ	W	18		Gray & Black Mixed Fine to Coarse SAND, Trace Silt and Clay, Trace Fine Gravel		1	,			
3	SS	χ_	W	28	 	Dark Gray Very Fine to Medium SAND, Trace to Little Silt and Clay			<u> </u>		1	
4	SS	X	W	27	[] 					· · · · · · · · · · · · · · · · · · ·		
5	SS	X	W	50	[], [], [] 20-	Lighter Gray with Scattered ½" Seams of Darker Soil of Same Description as Above						
6	SS	X	W	25	25					!		
7	SS	X	W	10	†_ 0 _ 30-	Siltier			-			
8		Χ	M.	60		Gray SILT, Trace Clay, Trace Sand Many ½" Seams & Streaks, Very Dense Silt	4.5+	 	 	<u>.</u>		
					35-							
WATER LEVEL OBSERVATIONS							GE	NEF	RAL	NO.	TES	
White Drilling 46" Upon Completion of Drilling								Start6/2/80 Complete6/2/80 Crew Chief Rig 750 Drilling Method Hollow Stem Auger				

VAR	ZYN

INGINEERING INC

LOG OF TEST BORING

Project	Subsurface Investigation
•	Outboard Marine Corportation
Location	Waukegan, Illinois

Boring No	-9
Surface Elevation	· · · · - ·
JOB NO C. 9177	
Sheet of	1

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS 53715 + TEL. (608) 257-4848

SAMPLE						VISUAL CLASSIFICATION	SOIL PROPERTIES						
	Reco	1	Moist		Denth	and Remarks	Qu	: W	lu	PL	٥		
	SS					FILL- Fine to Medium SAND, Some to Trace Silt and Gravel *		1		· · · · · · · · · · · · · · · · · · ·			
	<u>\$</u> \$	X	_ W	16	 5	Black Verv Fine to Medium SAND. Trace Organic, Trace to Some Silt and Clay		<u> </u>					
3	SS	8"	14	30		Gray Fine to Medium SAND, Trace to Little Silt & Clay, Trace Gravel							
4_	SS	7"_	l k	_33_	 15-				!	1			
5_	SS	6"	W_	32	20-	Gray Very Fine to Fine SAND, Trace to Little Silt and Clay							
	 -	12"		25				†	†				
B 7	SS SS	<u></u>											
8	SS		W			Gray SILT, Trace Clay, Trace Sand, Trace Fine Gravel, Scattered Layers Dense Silt End Boring at 33.5'	2.5						
					40	* Some Wood & Asphalt, No Recovery-Pushed							
WATER LEVEL OBSERVATIONS								ENEF					
While Drilling 22" Upon Completion of Drilling						Start 5/22/80 Demnglet 5/22/80 Crew Chief Rig 750 Drilling Method Hollow Stem Auger							

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INGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Waukegan, Illinois

Boring No 5-10
Surface Elevation 583.8
Job No. C 9177
Sneet 1 of 1

SAMPLE			E		VISUAL CLASSIFICATION	SOIL PROPERTIES						
	Reco	very	Mois	ture		and Remarks					•	
C.	Type	÷	į	N D	epth	2" Blacktop	Qu .	W	LL	PL	0	
		1' 2"	M	39 - 		FILL: Tan Very Fine to Coarse SAND with Gravel, Trace to Little Silt and Clay						
2	<u> SS</u>	ן י 2"	ij	26 -	- - 5							
3	SS	6"	W	19 -	- - - 10	Gray Very Fine to Fine SAND, Trace Silt and Clay			-			
					-							
<u>4</u>	SS	ין	W	21 -	- 15 - - -							
5	55	1.	W	30 -	- - 2 0							
6	SS	9"	W	30	- - - - 25 -							
7_	SS	1 ' 2'	M	22	- - - - 30 -	Gray SILT, Trace Clay, Trace Sand	3.5/			<u> </u>		
			-		-	End Boring at 30'						
					35 					!		
		-	-	 	- 40 ·		<u> </u>	<u> </u>		<u> </u>	ļ	
WATER LEVEL OBSERVATIONS							GE	ENE	RAL	NO.	TES	
While Drilling Upon Completion of Drilling Time After Drilling Denth to Water Don'th to Cave in						Star5/27/80Complet5/27/80 Crew Chief JWG Rig 55-1 Drilling Method Hollow Stem Auger						

WARZYN

ENGINEERING INC

LOG OF TEST BORING

Project	Subsurface Investigation
	Outboard Marine Corporation
Location	Waukegan, Illinois

Boring No	B-11
Surface Elevation	585.4
Jep No C 9177	
Sneet of	1

____1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS | 53715 + TEL. (608) 257-4648_

SAMPLE	VISUAL CLASSIFICATION	SOIL PROPERTIES							
Recovery Moisture	and Remarks			:		!			
No. Type + + N Depth	3" Blacktop	Qu	W	ll	PL	D			
1 55 1 4" 11 24 -	FILL: Tan Very Fine to Coarse SAND and Gravel & Stone Chips, Trace of Silt and Clay								
2 SS 1' W 23 - 5	Tan to Gray Very Fine to Fine SAND Trace Silt and Clay			!					
		i		· · · · · · · · · · · · · · · · · · ·					
3 SS'10" W 27 - 10 -	·			<u>:</u>	· 	:			
4 SS 10" W 42 15	Tan to Gray Very Fine to Fine SAND, Trace Silt and Clay			!	-	-			
15- 				:	i				
5 SS 1' W 38 - 20 -				1	· ——-				
6 SS 11" W 34 - 25-									
-0 -3 -25 - - - - - - - - - -									
	GRAVEL Some Fine to Coarse Sand			!		<u> </u>			
7 SS 1'4' M 21 F 30-	Gray SILT, Trace Clay, Trace Sand End Boring at 30'	3.0/			:				
35-					· · · · ·				
				!	:				
40-	·			!	<u></u>				
WATER	LEVEL OBSERVATIONS	GE	VER	AL	707	res			
While DrillingUpon Completion of Drilling Time After Drilling 14 h0	Crew	Chief a Met	JWG F	₹i g					
Depth to Water 3.01 Depth to Cave in		Holl	low S	tem A	uger				

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No B-12
Surface Elevation 585.2.
Job No C 9177
Snee:] of]

__ 1409 EMIL STREET + P O. BOX 9538, MADISON, WIS 53715 + TEL. (608) 257-4848.

	. s	AN	IPL	E		VISUAL CLASSIFICATION	so	IL P	ROF	ERT	TIES
	Reco	very	Mois	ture		and Remarks		i			:
No.	'Type'	: T	•	N	Depth		Q۷	; W		PL	Ď
<u> </u>	SS		11	14	-	FILL: Gray to Brown Very Fine to Coarse SAND, Trace Silt, Some Gravel & Cinders		;		:	
_2	SS	9"	W	15	 5 	Light Gray to Brown Very Fine to Fine SAND Trace Silt, Occasional Fiberous Material		i	:	:	:
3	SS	1'	W	24	- - - - - - - - - - - - - - - - - - -	Gray Very Fine to Fine SAND, Trace Silt and Clay					· · · · · · · · · · · · · · · · · · ·
4]	W	30							
l——				<u> </u>	1111		•		<u> </u>	; ;	
_5	SS	1'	W	33	20- 					t !	
6	SS	9"	<u>W</u>	28	25 - - - - - - - - -					1	
<u> </u>	ļ			-		GRAVEL Some Fine to Coarse Sand Gray SILT, Trace Clay, Trace Sand	3.5	;		i	<u>: </u>
	-	<u> </u>	<u>M</u>	23	30 -	End Boring at 30'	3.5			·	
<u> </u>	<u> </u>		 		F 40	4	 -	<u> </u>		 	
		<u> </u>	N	TA	ER	LEVEL OBSERVATIONS	GE	NE	RAL	NO.	TES
Up Tir De	hile Doon Cime At	omp iter (o Wa	letion Drillin	of I		7	Star Crev Drill	t5/28 w Chie	/80 or	nplete Rig	5/28/8 55-1

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SINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Bering No B-13
Surface Elevation 585.2
Job No. C 9177
Sneetlofl

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS 53715 + TEL. (608) 257-4848

SAMPLE				VISUAL CLASSIFICATION	SOIL PROPERTIES						
ecovery	Moi	sture		and Remarks		7					
pe v	₹	N	Depth		Qu	W		II.	PL	. D	
\$ X	M	18	1111	FILL: Brown to Gray, Very Fine to Coarse SAND, Some Gravel & Stone Chips, Trace to Little Silt and Clay						;	
5 1 <u>1</u> 1	' W	24	5	Light Brown Very Fine to Medium SAND, Trace Silt and Clay		;	<u> </u>				
	L										
S	W	24	10-	Gray Very Fine to Fine SAND, Trace to Little Silt and Clay		<u> </u>		-			
5 1 '2'	, W	23	- - - - - - - - - - - - - - - - - - -					!			
s 1 '1'	' W	32	20-								
יויין	' W	40	25-								
5_ X _	111	81	30-	GRAVEL Some Fine to Coarse Sand Gray SILT, Trace Clay, Trace Sand End Boring at 30'	4.5			i :			
			1 35 -								
_			40-								
Drillin Come After n to W	oletio Drilli /ater	n of E	Drilling		Sta Cre		/80 ief J	Com WG R	plete	5/29/8 5-1	

ARZYN

SINEERING INC

LOG OF TEST BORING

Project	Subsurface Inves	stigation
•	Outboard Marine	
Location	Waukegan, Illing	pis

Boring No
Surface Elevation 584.9 Job No. C 9177
Sneet of 1

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS 53715 + TEL. (608) 257-4848.

SAMPLE	VISUAL CLASSIFICATION	SOIL PROPERTIES						
Recovery Moisture	and Remarks	Qui	w : it	i il Pl				
ype v N Depth	3" Blacktop		H 11	<i>r</i> t	.			
55 1'4" M: 27 -	FILL: Brown SAND & GRAVEL, Trace to Little Silt and Clay	;						
SS 6" W 13 = 5			;					
	Gray Very Fine to Fine SAND, Trace Silt and Clay Occasional Gravel, Medium Sand							
X W 51 = 10-	·	<u>:</u> 						
SS 8" W 42 - 15					! 			
SS 8" W 42 - 15 -				!				
SS 1' W 40 20-	2" Layer Coarse Sand							
7" W 23 25-								
SS 1' W 15 F 30-			1		! !			
SS 1' M 66	Gray SILT. Trace Clay. Trace Sand End Boring at 31'6"	4.5/						
35-				: 				
40								
WATER	LEVEL OBSERVATIONS	GEN	IERAL	NO.	res			
Vhile Drilling Upon Completion of Drilling Time After Drilling 3 1		Crew C	29/80 _{Co} _{Chief} JWG Method W Stem A	Rig	55-1			

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation Outboard Marine Corporation

Boring No. ... B-15

Location Waukegan, Illinois

Surface Elevation 583.8 Job No. C 9177 Sneet of 1

_1409 EMIL STREET + P.O. BCX 9538, MADISON, WIS: 53715 + TEL. (608) 257-4848__

SAMPLE						VISUAL CLASSIFICATION SOIL PROPE				PER'	RTIES		
	Reco	very	Mois	ture		and Remarks	_		•				
No.	Type	T	+	N	Depth	1" Blacktop	l qu	W	ļ II	PL	D		
_	SS	Х	M	40	-	FILL: Brown SAND and GRAVEL			-				
	SS_	6"	W	22		Dark Gray Very Fine to Medium SAND, Trace Silt (Note: Strong Odor of of Fuel Oil) and Clay	:			!			
3	SS	6"	W	23		Gray Very Fine to Fine SAND, Trace Silt and Clay							
4	SS	7"	W	15	 -								
5	SS	9"	W	13		Seam Coarse Sand			:	:			
6	SS	9"	W	30	25 					•			
7	SS] <u>'3"</u>	W	46	30	# Gray SUT, Trace Clay, Trace Sand End Boring at 30'	4.5+ 4.5+			: !			
					35	* GRAVEL Some Fine to Coarse Sand							
					<u></u>								
WATER While Drilling Upon Completion of Drilling Time After Drilling Depth to Water Don'th to Cave In					Drillin ¹á ho	our	Star Crev Drilli	5/30, v Chii		mplete G _{Rig}			



LOG OF TEST BORING

Project Subsurface Investigation

Outboard Marine Corporation

Location Waukegan, Illinois

Boring No B-16
Surface Elevation 583.9
Job No C 9177
Shee: 1 of 1

_ 1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS 53715 + TEL. (608) 257-4848 __

	S	AM	PLI	Ξ		VISUAL CLASSIFICATION	so	IL I	PF	ROP	ER	TIE	s
	Reci	very	Moist	ure		and Remarks							
No.	Type	•	T	N	Depti	7" Blacktop	Q.) W	,	LL	PL		0
	SS	12"	W	21	<u></u>	FILL: Tan SAND & GRAVEL							
	· -				-	Gray & Tan Very Fine to Coarse SAND, Some	 						
2	SS	6"	W	19	Ξ.	to Little Gravel, Trace Silt and Clay		!		!	•	:	
					<u> </u>	Light Prous Vany Fine to Fine CAND Trace							
	ļ				1111	Light Brown Very Fine to Fine SAND, Trace Silt and Clay				· - <u></u>	<u> </u>	- :	
3	SS	4"	_W	32	<u> </u>			: 				!	
					-	Occasional Coarse Sand, Gravel Layer	ļ			!	:		
							_	 		1	· ! _		_
4	SS	4"	W	29	<u>-</u>			!		i			
					<u> </u>			İ		i 	ţ	i	
								!		•		:	
5	SS	7"		32	20	No Recovery on First 4 Attempts to Sample at 15', Recovery on 5th attempt		i		·······	1	!	
	1		<u> </u>					İ			!		
	İ				111						1	Ì	
	 	8"			+1			<u> </u>				-	
6	155	18.	W	31	- 25	-	 	 					
	!						+			!	:	!	
		 -	<u> </u>		E	Gray SILT, Some Clay	-					<u>i</u>	
7	S\$	12"	M	55	- 30	End Boring at 30'	4.5/	 		<u>:</u> I	<u>:</u>		
						and botting at 50				İ	1	1	
	-		L					 		i i	i	-	
					- <u> </u> 35	-		<u> </u>		<u>:</u>	. 	-	
	1		!		E			ĺ		<u>.</u>			
	<u> </u>							<u> </u>		<u> </u>	1	_	
	ļ				F 40	1		<u> </u>		!	!	+-	
	1	1	<u>'</u> W	/A		LEVEL OBSERVATIONS	GE	ENE	ER	AL	NO	TE	S
	hile D	rilling					 				npieti		
1				of	Drillin	9					Rig		
l			Orillin	g							Auge		
l	epth t						1	ָּיָטָ וֹיְוּיִ	٠. :	eciii''	بالباعاظ	' <i>.</i>	

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No	B-17					
Surface Eleva						
Job No . C 9	1.7.7					
Sneet	of1					

_1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS 53715 + TEL. (608) 257-4848.

	s	AM	PL	E		VISUAL CLASSIFICATION	SIFICATION SOIL F				PROPERTIES				
		-	Mois		•	and Remarks	Qu	·		PL	D				
No.					Depth	3 3/4" Asphalt	,,								
1	SS					FILL: Tan Fine to Coarse SAND Some Gravel		<u> </u>		·					
2	SS	_ X_	_ W	19	= = = = 5 -	Tan Fine to Coarse SAND, Trace Gravel, Trace Silt and Clay									
3	SS		W	29		Tan Fine to Medium SAND, Trace Silt & Clay Occasional ½" Seams Coarse Sand									
4	SS	X	W	27					:						
5	SS	<u>15"</u>	W	22		Gray Very Fine to Fine SAND, Trace to Some Silt and Clay					i I				
6	SS		 	25		GRAVEL Some Fine to Coarse Sand			1	:					
7		1	-W_	1	<u></u>		4.5+	 	-		 				
			W.		35-	End Boring at 30'									
-	1	·	N	/A	ER	LEVEL OBSERVATIONS	GE	ENE	RAL	NO.	TES				
U; Ti De	hile Doon Come Alepth to	omp fter [o Wa	etion Drillin ater	of i	Drilling		Star Crev Drilli	t6/3/ St. w Chie	80 ca Denni		6/3/80 750				

WARZYN

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No B-18
Surface Elevation 584.7
Job No C 9177
Sheet 1 of 1

1409 EMIL STREET + P.O. BOX 9538 MADISON, WIS. 53715 + TEL. (608) 257-4848

	S	AM	PL	Ε		VISUAL CLASSIFICATION	SOIL PROPERTIES						
	Recovery			ture		and Remarks	Qu	w	- 11	PL	ם		
No.	Type	•	•	N	Depth		1			г ь	_		
1	. SS	12"	M	12	_	FILL: Tan Fine to Medium SAND, Trace Silt							
						and Clav, Some Gravel			·	. ——.			
					F				 -	·			
2	_ss	_8"_	W	21	<u>-</u> 5 –	Light Brown Very Fine to Fine SAND, Trace		· 	· 		·		
					-	Silt and Clay		1 I					
			ļ		-				1				
	+ -				=	Occasional Coarse Sand	 	: 	1				
3	<u> SS</u>	7"	<u> W</u>	27	- 10 –	·		!		· ——	· 		
			1		_		1	į	}		;		
			[]	1 !				; !		:	į		
4		6"	!		-			!	!	:			
4	22	<u></u>	W_	28	- 15-					. ——	<u>. ———</u>		
				!	_	·			!	i	į		
1	!	l i		:	_				İ	,	·		
5	155	1 2 "	 W	49		Coarse Sand Layer			:	!			
	1	<u> </u>			20 - 				i	1	!		
				Ì	<u> -</u>) 	i I	i i	:		
	<u> </u>		<u> </u>		F				<u>:</u>	·	!		
6	SS	1 2"	W	30	<u>├</u> 25 -				<u>:</u>				
			1		<u> </u>	·			:	:	!		
		•	1	•			1		:		! !		
	 -	 	 -	 		Gray SILT, Some Clay	4.5+	,	- 	<u></u>	!		
7_	LSS.	_X_	<u>M_</u>	<u>: 58</u>	30 -	End boring at 30'	4.5+		┪	· 	<u> </u>		
					F	End boring at 50				į	i İ		
					E					1	! !		
	-	1			_				1		!		
				 	-E 35-			; 	!		 		
	Ì	İ			E			<u> </u>	i	i	İ		
L	<u> </u>		<u>!</u>		<u> </u>		ļ	<u> </u>	1	! 	ļ		
					<u></u>				1	<u> </u>	ļ		
	1	1	1	10-	<u> </u>	LEVEL OBSERVATIONS	G	NE	Α1	NO	TES		
WATER LEVEL OBSERVATIONS							GENERAL NOTES						
While Drilling								Start 6/2/80 Complete 6/2/80					
Upon Completion of Drilling								Crew Chief JWGRig 55-1					
Time After Drilling ½ hour								Drilling Method Hollow Stem Auger					
Depth to Water 3'							;5	A.A.Y.M :		- 3 - 1			

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. 8-19
Surface Elevation 584.4

Job No. C 9177

Sheet 1 of 1

. 1409 EMIL STREET • P.O. BOX 9538, MADISON, WIS. 53715 • TEL. (608) 257-4848...

SAMPLE						VISUAL CLASSIFICATION	so	IL PF	ROP	SOIL PROPERTIES					
Recovery Moisture			ture		and Remarks	Qu	w		01						
No.	Type	+	+	N	Depth		4.		LL	PL	D				
	SS	1	М	20	 -	FILL: Tan SAND & GRAVEL, Trace Silt & Clay			1						
		-;					-		 	!					
2	SS	1.	W	16	- - -	Tan Very Fine to Coarse SAND, Trace Silt, and Clay, Trace Gravel									
					<u> </u>	and cray, irace Grave!									
									ļ						
3	SS	6"	W	31	<u>+</u> - 10 -										
					<u> </u>										
						Cray Vory Fire to Fire Sand Trace Silt					`				
4	SS	1.	W	40	<u>+</u>	Gray Very Fine to Fine Sand, Trace Silt and Clay									
				, ,	15-										
					E										
	SS	11	W	36	_										
	33			30	— 20 – —										
					Ē			i							
6	SS	7 1	W	27											
	33				<u>-</u> 25 –										
					Ē										
7	cc	<u>1' 3"</u>		81	E	Gray SILT, Some Clay, Trace Sand	4.5/			1					
1	33				- 30 -	End Boring at 30'	4.5+								
					E										
					E										
					= 35-										
				}	E										
					<u>-</u>										
					- 40 -	LEVEL OBSERVATIONS		NICC	A.						
WATER LEVEL OBSERVATIONS							GENERAL NOTES								
While Drilling							Starf/2/80 Complet 6/2/80 Crew Chief JWG Rig 55-1								
Time After Drilling 1/2 hour							Drilling Method								
Depth to Water 3'0"							l!	Hollow	Ster	n Aug	er				

WATER LEVEL OBSERVATIONS Stent 6/3/80 Complete 55-1 Prilling Completion of Prilling Completion of Prilling After Drilling After Drilling The Noter The Not	w 23 20 and Clay and	W 23 15 Fine to Fine SAND, Trace Silt	AND, aw up PL	LOG OF TEST BORING Subsurface Investigation Project Outboard Marine Corporation Waukegana Illinois Location Waukegana Illinois

LOG OF TEST BORING

Project	Subsurface Investigation
	Outboard Marine Corporation
	Waukegan, Illinois

Boring No.	B-21
Surface Elevation	583.8
Job No. C 9177	7
Sheet1 o	f

. 1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848...

SAMPLE VISUAL CLASSIE						VISUAL CLASSIFICATION	so	IL PF	ROP	ERT	TES
	Reco	YETY	Mois	ture		_ · · · · · · · · · · · · · · · · · · ·					
No.	Type	1	1	N	Depth	and Remarks 4" Asphalt	- Qu	W	u	PL	1
T	SS	Χ	М	19	-	FILL: Tan Fine to Coarse SAND & GRAVEL,			l .		
	1				-	Trace Silt					
					F						
2	SS	χ	W	18	E 5_						
				<u> </u>	-	Const. Fine to Madi. CAND. T					
					F	Gray Fine to Medium SAND, Trace Silt and Clay	<u> </u>				
					E	Occasional Wood Fragments	 		-		
3	SS	Х	W	28	<u> </u>		ļ		 		
,]]				F						,
					E						
4	SS	12"	W	27	<u> </u>						
	33	14	W	3/	F 15-		 				
]	E]]		
					F						
5	SS	12"	W	28	E 20_	Occasional Black Streaks at 20'					
					F						
					F	Gray Very Fine to Fine SAND, Trace to Some Silt and Clay				ľ	
					E	•					
6	SS	Х	W	26	E 25-						
					F		4		} }	1	
					E	Gray SILT, Trace Clay, Trace Sand					
7	SS	_X_	М	29	F 30-	End Boring at 29'	-				
					F	CDAVEL Come Fire As Come Co.					
					E	* GRAVEL Some Fine to Coarse Sand					
	1		 		† -						
				-	35-						
					E						
					F						
					E 40						
	1				_ 40 -	1 5/5/ 00050/45/04/0			1		
					EK	LEVEL OBSERVATIONS	1	NER			
Wh	While Drilling 26"				Star	t 6/3/8 St. D v Chief	Ocom	plete	6/3/		
•	_				Drilling						
	ne Af			9 -			Ho	ng Met 11ow S	nod tem A	uger	•••••
	pth to			-			1				-

B A A A A A A A A A A A A A A A A A A A	
LOG OF TEST BORING Surface Elevation Surface Elevation Surface Elevation Source Elevation S	84
LOG OF TEST BORTON Surface Elevation C 9177	
Job No. 1 of	
Project Outboard Marines	
Waukegan 1 TEL. (608) 257-46	POTIES
Subsurface Thing Corporation Sneet Outboard Marine Corporation S	ERIL
Outboard Marile Outboard Marile Outboard Marile Naukegan Illinois Location Waukegan Illinois Location Waukegan Madison, wis 53715 TEL (608) 257-4848 Location Waukegan Soil PROP JA09 EMIL STREET P.O. BOX 9538, MADISON, WIS 53715 TEL (608) 257-4848 VISUAL CLASSIFICATION Qu W LL ADJ E VISUAL CLASSIFICATION	PL
-1404 CLASSIFICA	
1 VISUAL DOMARKS	T
Whoisture Whoisture Whoisture Whoisture Whoisture Whoisture Whoisture FILL: Tan SAND, Some Grave Tan SAND, Some Grave	
N Depth 3" Bracks SAND, Some	+ 1
M 195 SAND, Some	
sine to Coarse state	
to Gray Very	
Tan to Gray Very Fine to Coarse SAND, Some to Little Gravel	
1/4" W COE 3 160 E100	\ \ \ \ !
++E1	
THE .	
SS 1' W 20 = 10 Some to Trace	
SAID, Some to	
E Fine to Fine James	
SS 1' W 20 F 10 Fine SAND, Some to Trace Gray Very Fine to Fine SAND, Some to Trace	
SS1'2" W 45 IS Gray Very Clay	
158/1ET E	
- 1012" W 26 - 20-1	
5 SS1'2" N 26 207	1
6 SSN'3" W 35 25 GRAVEL Some Fine to Coarse Sand GRAVEL Some Fine to Coarse Sand 4.	
Some Fine to Coarses Sand 4.	5/1
6 SSN'3" W 35 25 GRAVEL Some Fine to over Trace Sand 4.	5
6 SSN'3" W 35 25 GRAVEL Some Fine to Countrace Sand Gray SILT, Trace Clay, Trace Sand Gray SILT, Trace Clay, Trace Sand 4.	
Gray SILT, Trace End Boring at 30'	+ 1 - 1
	1 1
7 55 7 -	
<u> </u>	
	GENERAL NOTES
	GENERAL 6/4/84
- III - FIONS	6/4/80Compiles 55-1. 1
ENT ENT SEERVATIONS	Crew Chief JNO AND
TO LEVEL OBSE	Crew Chief JWG Rio Crew Chief JWG Rio Drilling Method Drilling Method Auger
WATER LEVEL OBSERVATIONS	Drilling Method Hollow Stem Auger
	— \
While Drilling of Drilling hour	— 1
While Drilling Upon Completion of Drilling Upon Completion of 1/2 hour After Drilling 3:0"	and the second s
Upon Complete 310" Time After Drilling 310"	
1 7 11110	

ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. B-23
Surface Elevation 584.4
Job No. C 9177
Sheet 1 of 1

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848

SAMPLE Recovery Moisture		VISUAL CLASSIFICATION				so	IL P	30 P	ERT	TES	
			and Remarks								
No.	Type	+	†	N	Depth	3" Blacktop	9.	W	l II	PL	D
	185	X	М	17	-	FILL: Gravel					
	1				E				1		
	 - 				E	Gray and Tan Very Fine to Fine SAND, Trace		 	 	 	
_		011		-	†	Silt and Clay		 	 -	}	
2	SS	9"	W	20	<u>├</u> 5 —				ļ		ļ
					[
					F	Occasional Gravel, Coarse Sand			ļ		
					-				ļ	ļ	
. 3	ss	וין	W	45	E 10-		<u> </u>				
					E	·					
			·		<u></u>			1			ĺ
	} }				<u></u>		1	1			1
4	SS	6"	W	27	F						
-4	33	-	W	21	- 15-			 	 -		
					-						
		Į.			F			Į			
					E				 	<u> </u>	ļ ———
5	SS	١,	W	39	E20-				ļ		
					<u></u>						i
					-						1
				l	F						
6	SS	יין ין	W	18	F		1				ļ
-	133	<u></u>		10	- 25 -						
					E	<u></u>					
l					Ε	Gray SILT, Some Clay		ļ	-		
		71.41			_	Gray Sill, Some Clay	4 5	,	†		
7	SS	1.4	M_	86	[-30-	End Boring at 29'	4.5+ 4.5+	<u> </u>	┼-		
ł					E		4.5				
1	'			1	-						
 				├	+						
1					F ₃₅ -						<u></u>
					E		ł				
1					<u></u>						
l				l	F				<u></u>		
					F						
 	+			-	[40-	1		 	<u> </u>		
			W	/AT	ER	LEVEL OBSERVATIONS	GE	NER	AL	ron	res
14/1	nile D	-:11:55					Star	\$/27/8	30~~~	5	/27/80
_	While Drilling Upon Completion of Drilling					v Chief					
					rilling ho 🛂		1			_	
1	ne Af			9 -	41			ng Met			
i e	pth to			-	-		1.00.1	low St	elli AL	ישבו	
∖ De	oth to	Cav	ve In	•						· · · · · · · · · · · · · · · · · · ·	



Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No	B-24
Surface Elevat	ion 583.9
Job No C	9177
Sheet	. of

— 1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848.

		ΔM	PL	E		VISUAL CLASSIFICATION		IL PF	ROP	ERT	IES			
	Reco	very	Mois	ture		and Remarks			T	Ī				
No.	Type	+	+	N	Depth	3½" Asphalt	q.	W	LL	PL	0			
			- 4	1,		*			<u> </u>	-				
	SS	X	M	11	Εl	Ton Fine to Medium CAND Trees 6:34 0 03								
2	SS	χ	W	30	<u> </u>	Tan Fine to Medium SAND, Trace Silt & Clay Occasional Gravel Seams								
				<u> </u>	<u> </u>									
3	SS	6"	W	28	<u>+</u> 									
					F 10-	·								
					E]		-			
4	55	χ	W	25	F	Gray Very Fine to Fine SAND, Trace Silt &			 					
	-33	^_		ب	上 15-	Clay, Trace Gravel								
					F									
			 	24	E				-					
5	SS	<u> </u>	W	34	<u>-</u> 20 ~									
					-				!					
				-	E									
6	SS	X	W	26	25-									
					E	GRAVEL with Fine to Coarse Sand Gray SILT, Some to Little Clay, Little to								
			-		£	Trace Sand, Trace Gravel								
7_	SS	_X_	M	51	30-	End Boring at 30'								
					E									
			<u> </u>	 	E	* FILL: Tan Fine to Coarse SAND & GRAVEL Trace Silt & Clay	 							
	-				[35-	Trace Stite a city								
					E									
				<u> </u>	<u> </u>									
			<u> </u>	 	<u>-</u> 40-	-			 	 				
	·		V	/A7	FER	LEVEL OBSERVATIONS	GE	NER	AL	TON	ES			
		omp	etion	n of I)		t 6/3/8 St. v Chief						
Tir	ne At	ter L	Jrillin	. פי			וווזטן	Drilling Method						



Project	Subsurface Investigation
	Outboard Marine Corporation
Location	Waukegan, Illinois

Boring No. B25	•••
Surface Elevation	
JOD NO. C 9177	•••••
54000	3

=1409 EMIL STREET • P.O. BOX 9538, MADISON, WIS. 53715 • TEL. (608) 257-4848,

SAMPLE VISUAL CLASSIFICATION	sc	IL PI	ROF	ERT	IES
Recovery Moisture and Remarks	Du		1		
No. Type + H Depth 6" Blacktop		W	II.	PL	D
FILL: Tan SAND & GRAVEL, Little to		 	+	 	
1 SS 1' M 14 Trace Silt and Clay			-	 	
2 SS 1' W 13 F 5 Occasional Gravel		 	-	 	
2 33 1 W 13 5 Occasional Gravel					
		<u> </u>	1		
Gray Very Fine to Fine SAND, Trace Silt and Clay		 	 	+	
3 SS 1 W 33 F 10 and Clay		 	 	 -	
				}	
				<u> </u>	l
4 SS 1' W 62 F 15					
			}		
	}	 	 	-	
5 SS 1" W 10 = 20		 -	+		
CRAVEL Some Sine to Source Source		 			
6 SS 1 W 63 GRAVEL Some Fine to Coarse Sand	==		ļ		
7 SS 3" M - E End Boring at 25'					
30-* Gray SILT, Some Clay					
Gray Sill, Some Clay					
1					
 - - - - - 		 	†	†	
35-			+	-	
	[
<u> </u>		 	 		
F40-	ļ	ļ	 		
WATER LEVEL OBSERVATIONS	GI	ENER	AL	NOT	res
While Drilling		rt6/3/8			
Upon Completion of Drilling		w Chief			
	Drilling Method				
Time After Drilling $\frac{1}{3}$ hour	<i>U</i> ''''		+		



Project	Subsurface Investigation
	Outboard Marine Corporation
Location	Waukegan, Illinois

Boring No. B26	
Surface Elevation .	584.4
JOB NO. C 9177	•••••
Sheet of .	1

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848

-		SAMPLE					VISUAL CLASSIFICATION	so	IL PF	ROP	ERT	IES
		Recovery Moisture			and Remarks					_		
	No.	Type	+	1	N	Depth	3½" Asphalt	Q.	W	LL	PL	D
'				ļ		-	*					
	1	SS	_X	М	15	††††	FILL: Brown & Black Fine to Medium SAND Trace Silt and Clay					
-	2	SS	X	M	15	<u> </u> 5 _	Gray Fine to Coarse SAND and Fine to Coarse Gravel, Trace Silt and Clay					
						<u> </u> Τ Ττ						
	3	SS	10"	Н	25	10-						
_						1.1.1	Gray Fine to Medium SAND, Trace to Some Silt and Clay					
۲.	4	SS	12"	W	42	F ₁₅						
						E						
· - ,							Soil Contains Black Material					
	5	SS	X	W	19	E 20 -						
_						بليل	Gray Silt-Many 4" to 6" Layers Clayey SILT					
_	_6_	SS	X	W	4	<u> </u>	Scattered ኑ Seams Coarse Sand					
							GRAVEL, Some Fine to Coarse SAND					
_	7	SS	6"	M	74		Gray SILT, Trace Clay, Trace Sand	4.5+			-	
۷		-				 30 -	End Boring at 29'					
-							* FILL: Tan Fine to Coarse SAND and					
						_ 	GRAVEL, Trace to Some Silt & Clay					
							Citay					
-												
						E 40-						
				W	/AT	ER	LEVEL OBSERVATIONS	GE	NER	AL I	NOT	ES
		nile Di on Co	_		23'			Star S1 Crev	6/4/80 t. Deni	Com	plete/	4/80 50
,	Tin	ne Af	ter C	Drillin		_		 ∀rilli	ng Met	hod		
		pth to			-			<u>.Ho.l.</u>	low St	<u>sw</u> An	ger	
w.	De	pth to	Cav	ve In	-					•••••	· ·····	



Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring N	o. B27	••••
_	Elevation	
Job No	C 9177	•••••
Sheet	of .	1

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	s	AM	IPL	E		VISUAL CLASSIFICATION	so	IL PF	VISUAL CLASSIFICATION SOIL PROPE						
	Reco	very	Mois	ture		and Remarks									
No.	Type	1	‡	N	Depth	3½" Asphalt	Qu	W	LL	PL	0				
1	SS	6"	М	17		FILL: Brown Fine to Medium SAND & GRAVEL Trace Silt and Clay									
2	SS	6"	W	15	5 -	Dark Gray									
					EL L										
3	SS	12"	W	19	- - - - - - -	Gray Very Fine to Fine SAND, Trace to Some Silt and Clay									
4	SS	X	W	26	F 15-										
<u> </u>	55			00											
5	SS	X	W	29	20 - 										
					E]								
6		NR	<u>-</u>	1	25-	Gray SILT, Some to Little Sand & Clay, Little to Trace Gravel									
7	35	415"	М	100		End Borino at 26岁'									
					30-										
-	-	-		_											
					- 35 - - - -										
			-		<u>-</u> -40-										
 	1	1	<u> </u>	/AT		LEVEL OBSERVATIONS	GE	NER	AL	רסת	ES				
, w	hile D	rilling	3	8"_			Start 6/6/80 Complet 6/6/80 Crew Chief Rig 750								
	me A						Drilli	ng Met	hod						
1	pth t					Hol	low St	em Au	iger	····					
\ De	pth t	o Ca	ve in												

4



Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring NoB28
Surface Elevation 585.2
Job No. C 9177
Sheet of 1

. 1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848.

	S	AM	PL	E		VISUAL CLASSIFICATION	SOIL PROPERTIES					
No.	Reco	very	Moisture N Depth			and Remarks	Дa	w	LL	PL	D	
1		1 '2"	М	25	<u>-</u>	Tan SAND & GRAVEL, Little to Trace Silt and Clay						
2	SS	ן ין י	W	3	5 -	Dark Gray SAND, Some to Little Organic Silt, Trace Gravel Fibrous Material Noted						
-					E E	Gray Very Fine to Fine SAND, Trace Silt and Clay						
3_	SS	6"	W	25	- - - 10-	,			-			
						Lighter						
4	SS	ייבי ד	M	37	<u> -</u> - -	4" Layer Coarse Sand				-		
_ 5	SS	1.5	W	38	<u>=</u> 20 -							
_ 6	SS	X	W	62		Gray SILT, Some Clay, Little to Trace						
7	ss	3	М	117	F	Sand and Gravel End Boring at 29'0"	4.5/ 4.5					
					₩ 30 - E E	End bor ring at 25 o						
					- - - 35-							
					[40-							
	<u> </u>	·	V	/A7	ER	LEVEL OBSERVATIONS	GE	NER	AL	TON	ES	
Up Tin	While Drilling Upon Completion of Drilling Time After Drilling Depth to Water Depth to Water							Start 6/4/80Complete 6/4/80 Crew Chief JWG Rig 55-1 Drilling Method Hollow Stem Augers				

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. B25)
Surface Elevation .	584.8
JOB NO C. 9177	
Sheet of	

	S	AM	PL	E		VISUAL CLASSIFICATION SOIL PROPERTIE								
	Recovery Moisture			ture		and Remarks	Q+	w	u	PL	D			
Na.	Туре	+	+	N	Depth		,	**	LL	PL.	U			
-	SS	χ	M	11	111	Tan Fine to Medium SAND, Some to Little Silt, Trace Gravel, Blue Clay & Silt 1½' to								
						23'								
2	SS	χ	W	10	<u>-</u> 5-									
					E	Black Fine to Coarse SAND, Some Fine to Coarse Gravel, Trace to Little Silt & Clay								
-					E	-								
3	SS	X	W	<u> </u>	10-									
					-									
Δ	SS		W	15	E ₁₅₋	Gray Very Fine to Medium SAND Little to								
					F 13-	Trace Silt and Clay, Trace Fine Gravel								
					E									
5	SS	χ	W	38	F-20-									
					E									
<u> </u>		 			<u> </u>									
6	SS	_ X_	M	33	E ₂₅₋	**	4.5+							
					E	End Boring at 25'		,						
_					E	* 3" FILL: Black Fine to Coarse SAND,								
-	-			-	30-	Some to Trace Silt and Gravel	 							
}					E	** Gray SILT, Some Clay, Very Scattered								
-					E	1/16" Seams of Clay	 -							
					35-									
					<u> </u>									
-	1		1 W	\A7	TER	LEVEL OBSERVATIONS	GE	NER	AL	NOT	res			
W	hile D	rilling					Star	+6/5/8 St. De v Chi e f	0Com	plete	6/5/80			
1	Upon Completion of Drilling													
1	Time After Drilling									Drilling Method				
100	oth to	o Ca	ve In	١.					••••	· · · · · •				

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No		B30				
Surface E						
Job No	С	9177				
Sheet	1	of	1			

__ 1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848.

7	S	ΑM	PL	E		VISUAL CLASSIFICATION	so	IL PF	ROP	ERT	IES D				
	Reco	very	Mois	ture		and Remarks									
No.	Туре	↓	↓	N	Depth		q.	W	LL	PL	0				
					τ τ	Cinders	<u> </u>		-						
1	SS	X	<u>M</u>	14		Attempted Twice to Obtain Sample 2	†		<u> </u>						
2	SS	3"	W	3	-	Gray Very Fine to Coarse SAND, Trace Silt and Clay									
					E 3 -										
							ļ								
3	SS	יו	W	39	+	Gray Very Fine to Fine SAND, Trace Silt									
	- 5				<u> </u>	and Clav. Trace Fine Gravel									
					F										
	SS	9"	W	22	E		-								
4	22	-	W		<u> </u>				-						
					<u> </u>										
	-			•					-						
5	SS	1	W	46	20 -		-								
		!			E										
				-	Ē,										
6	SS	X	M	25	<u> -</u> 25 -	* End Boring at 25'	4.5+	/							
					E		4.5								
			:		F	* Gray SILT, Some to Little Sand & Clay, Little to Trace Gravel				-					
		-			[30-										
i															
					<u> </u>										
					E35-		ļ								
					F • • • • • • • • • • • • • • • • • • •										
					E										
					E.										
			W	/Δ7	FP	LEVEL OBSERVATIONS	GE	NER	ΔΙ	NOT					
	·	••••				ELVEL ODOLINATION	 	6/6/8							
While Drilling							Star	v Chief	JWG	plet <i>ë (</i> lia	55				
Time After Drilling ½ hour 2'6"						Drilli	ng Met	hod		•••••					
			ter		7'K"			I Day C	-am A						



Project	Subsurface Investigation
	Outboard Marine Corporation
Location	Waukegan, Illinois

Boring No
Surface Elevation 584.1
Job No. C 9177
Sheet 1 of 1

.1409 EMIL STREET • P.O. BOX 9538, MADISON, WIS. 53715 • TEL. (608) 257-4848...

1	SAMPLE Recovery Moisture						VISUAL CLASSIFICATION	so	SOIL PROPERTIE				
-	No.	Reco	,	Mois		Depth	and Remarks	٩u	w	u	PL	D	
-	1	SS	j	М	33	<u>-</u>	Brown SAND and GRAVEL, Little to Trace Silt and Clay						
-	2	SS	4"	W	2	- 5 -							
-						1							
	3	SS) '	W	33	<u> -</u> 10-	Gray Very Fine to Fine SAND, Trace Silt and Clay						
- -			110			البليل			·				
-	4_	SS	1'2'	W	13	- 15-							
-	5_	SS	7,	W	49	<u>-</u> - 20-							
-													
-	6	SS	1 '4'	W	41	25-	*	4.5					
						ELL	End Boring at 25'	4.5					
-						- - - - 30-	* Gray SILT, Some to Little Clay, Little to Trace Sand, Trace Gravel						
-													
. .						35-							
-		 		<u> </u>		48-	1		 				
	WATER LEVEL OBSERVATIONS While Drilling Upon Completion of Drilling Time After Drilling hour								GENERAL NOTES Start 6/5/80 Complet 6/5/80 Crew Chief JWG Rig 55-1 Drilling Method				
-		Depth to Water 3.1 Hollow Stem Auger Depth to Cave In											

LOG OF TEST BORING

Project	Subsurface Investigation
	Outboard Marine Corporation
	Waukegan, Illinois

Boring No.	332
Surface Elevation	584.6
JOB NO. C 9177	
Sheet 1 o	e 1

. 1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848...

SAMPLE				E		VISUAL CLASSIFICATION		SOIL PROPERTIES							
Recovery Moisture			and Remarks			1									
No.	Type	1	↓	N	Depth]	Qu	W	II	PL	D				
					<u>F</u>	Fills Drown & Disab Fine to Medius CAND			ļ						
1	SS	10"	М	3	F	FILL: Brown & Black Fine to Medium SAND, Trace Silt and Clay									
		011		-		•									
2	SS	8	W	9	- 5	Black & Gray Fine to Coarse SAND, Fine to Coarse Gravel, Trace Silt and Clay			ļ						
				_	Ė.	Black Oily Substance Noted in Sample									
				-	 										
3	SS	χ	W	14	F.,										
					E 10-	Gray Fine to Coarse SAND, Trace Silt									
					E	& Clay, Trace Gravel									
					£		 								
4	SS	14"	W	16	<u> </u>										
					F										
					E										
5	SS	χ	W	41	-										
<u> </u>	- 33	^	-" -	1 3,	£ 20 -	Gray SILT, Some to Little Clay, Little to					·				
6A	{		W		E.	Trace Sand Trace Gravel									
6B					F	Note Oil Smell in Bottom 3" of Sample 5									
60	SS	X	M	92	上 ₂₅ -	23'6" to 23'7" 4" Piece of Wood	4.5+	<i>'</i>							
			}		-	End Boring at 25'	4.5								
					E		}								
	-			-	<u> </u>										
					- 30 -										
				1	E										
		- 			<u> </u>										
					<u>├</u> 35-										
					E 33-	* GRAVEL, Some Fine to Coarse Sand									
				1											
	-			-	E										
	ļi		 		- 40 -		 								
WATER LEVEL OBSERVATIONS GENERAL NO								707	ES						
								5/5/8							
Upon Completion of Drilling							Start 6/5/80 Complete 6/5/80 St. Dennis Crew Chief Rig. 750								
							Drilling Method								
De	pth t	sW a	ter				HO	110M 2	cem A	uger	•••••				
Depth to Cave In															

	While Drilling Upon Completion of Drilling Time After Drilling Time After Drilling Time After Drilling
	While Drilling of Drilling
Drilling Method Auger Hollow	
Crew Chief Method Augel	WATER LEVEL OBSERVATIONS
618 2 1 1 200 1 25 1 25 1 25 1 25 1 25 1 25	SNOITAV83290 LOLA
CENERAL 1000 750	
GENERAL NOTES	1 3 1 1 1 1 1 1 1
	-56
	H
	- Se Gui Jog puz souls 32 W "3 SS - 1
	1 90 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	10.19 - (VBI) = 1311 = 3114 = 3108 131400 H
	of 9131:1 VOTS 92760) of ASS ASS ASS ASS ASS ASS ASS ASS ASS AS
	1 = 1 1 1 es v
	-SI -ZE M X SS D
	100283115]]
	Gray Very Fine to Medium SAND, Trace Sine to Medium Gravel
	SS17" W 14 Fine to Medium SAND, Trace Fine to Medium Gravel
	SUR FRILS S JUL M X SS
	Tan and Black Fine Co No X 25
	ANAS mulbam of
	Tudad N 1
	Moisture Haisture Black CINDERS WITH FINE CO
	= 110
I Find	
1 10 10	EERING INC STREET P.O. BOX 9538, MADISON, INC. SOIL PROF
SELLES	EERING INC LOCATION MAUKEGAM, MIS. 53715 . TEL. (608) 257-4846 LOCATION OUTDON, WIS. 53715 . TEL. (608) 257-4846 MOUTDON OUTD
	Project Subsuited Marine Corput and Sans and Sanset Marine Corput and S
10	The state of the s
	Surface Investigation LOG OF TEST BOS No
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ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No	B34
Surface Elevation	584.9
Job No. C 9177	
Sheet 1 of	1

. 1409 EMIL STREET + P.O. BCX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848.

SAMPLE			E		VISUAL CLASSIFICATION	SOIL PROPERTIES							
No.	Reco	very	Mois	ture	Depth	and Remarks		w	u	PL	D		
	<i></i>	<u>-i</u>		<u> </u>	 	FILL: Tan SAND & GRAVEL, Some to Little			<u> </u>				
1	SS	Χ_	М	40		Silt and Clay							
2	SS	ין	M	5	-								
					E,-	Gray Very Fine to Fine SAND, Trace Silt and Clay, Trace Fine Gravel							
		_				and order, frace time draver	<u> </u>						
3	SS	1' 2"	W	20	F 10-								
					-								
					E								
4	SS	<u>1 '3''</u>	W	40	F 15-	2" Layer Coarse Sand, Gravel							
					F						•		
					E								
5_	SS	11"	W	65	<u> -</u> 20-								
					Ē								
			ļ	ļ	F	GRAVEL Some Fine to Coarse Sand	-						
6_	SS	1 '4"	M	38	<u> </u>	Gray SILT, Trace Clay, Trace Sand	4.5/						
					E	End Boring at 25'	7.3						
				ļ	<u> </u>								
	ļ			-	- 30-		ļ						
					E								
	<u> </u>			ļ	Ė								
	ļ				35-								
					E								
					E		-						
			<u></u>	<u> </u>	40-	1							
	WATER LEVEL OBSERVATIONS						GE	NER	AL	NOT	ES		
While Drilling							t6/5/8						
Upon Completion of Drilling						Crew Chief JWG Rig 55-1 Drilling Method							
Depth to Water 3'4"						Hol	low St	em Au	ger	••••••			
Denth to Cave In													

ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. B35
Surface Elevation 584.3
Job No. C 9177
Sheet 1 of 1

... 1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848...

SAMPLE						VISUAL CLASSIFICATION	SOIL PROPERTIES						
Recovery Moisture No. Type + N De			and Remarks		w	lı	PL	D					
No.	Type	+	+	N	Depth								
1	SS	Х	W	2		Black Fine to Medium SAND, Trace to Little							
2	SS	χ	W	11		Silt and Clay			 				
	33		<u> </u>	- 11	5 -								
					<u>-</u>								
3	SS	Х	W	16	<u>-</u>	Died Venu Fine de Fine CAND Turce Cila							
	3,5			10	- 10 -	Black Very Fine to Fine SAND, Trace Silt and Clay							
					E								
4	SS	χ	W	23	- - 15-								
					E 13-								
l		İ			E								
5	SS	X	W	32	<u> -</u> 20	Black Very Fine to Fine SAND, Some to	 	ļ					
					E	Little Silt and Clay and Clay	<u> </u>						
					<u>-</u> -								
6	SS	X	W	9	25-		 						
				}	E								
					<u> </u>								
7	SS	12"	W .	87	- 30 -	Black Fine to Coarse SAND, Some Gravel, Some to Little Silt							
		. i			F								
 8	- < <	X	М	33	E	Gray SILT, Some Clay							
۲	33		<u>''</u>	-	35-	End Boring at 35'							
						Note: Samples 1-6 had a very strong odor,							
					F	similar to tar							
WATER LEVEL OBSERVATIONS							GE	ENER	AL	TON	ES		
							 						
	Upon Completion of Drilling Crew Chief Rig 750							/50					
l	Time After Drilling Drilling Method												
l	Depth to Cave In							•••••					

	LOG OF TEST BORING Boring No. 836. Surface Elevation C 9177 Job No. 1 of	585.0
	Subsurface Investigation Subsurface Investigation Outboard Marine Corporation Surface Elevation Surfac	
17イル	Subsuited Marine Correction Sheet	
	Docation Waukegan, Illinois Location Waukegan, Illinois TREET . P.O. BOX 9538. MADISON. WIS. 53715 . TEL. (608) 257-4848 SOIL PROPE TREET . P.O. BOX 9538. MADISON. WIS. 53715 . TEL. (608) 257-4848	RTIES
ERING INC	20x 9335	
EMITOD 1409 EMIL S	VISUAL CLASSIFICATION QU W IL	PL D
	VISUAL CLASSIN and Remarks	
AMPLE	and Cinders	
OVERY Moisture	FILL: Loose Black Coal and Cinders	
	FILL: Loose Brown SAND, Trace Silt and	
STX MA	Tan Fine to Medium Same	
- X W 10E	-5 Clay	++11
35 1		
4	Trace	
	Black Very Fine to Medium SAND, Trace	
+35	E Black Very Clay Silt and Clay	
		++111
SS 11" W	19 [15]	+ 1
T	E Medium SAND, Some to	
1	Black Very Fine to Medium SAND, Some to Little Silt and Clay 4.54	
5 SS X W	Little Silt and 4.5+	
	in at 25'	
SS 12"	** End Boring at 25'	
6 55 12	TE Charse Sand	T. -
-	# GRAVEL, Some Fine to Coarse Sand & Clay.	
:	** Gray SILT. Some to Little to Trace Gravel Little to Trace Gravel Note: Samples 3-5 had a very strong odor	
	Samples 3-3 to tar	
L	Similal So	NOTES
		GENERAL NOTES
- _	FOVATIONS	6/4/80593bie 750
	WATER LEVEL OBSERVATIONS	Crew Chief Rig Crew Chief Drilling Method
-	WATEN	Drilling Method Hollow Stem Auger
While E	Completion of Drilling	-
Upon	After Drilling	
, Time	14121	

ENGINEERING INC

LOG OF TEST BORING

Project .	Subsurface Investigation
	Outhoard Marine Corporation
	Waukegan, Illinois

Boring No	B37
Surface Elevation	
Job No. C 9177	••••••
Sneet of	1

..... 1409 EMIL STREET + P.D. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848...

		SAMPLE					VISUAL CLASSIFICATION		SOIL PROPERTIES							
	Recovery Moisture			and Remarks		W	LL	PL	ם							
	10.	Type	4	+	N	Depth	Sill Dist COM At Consul Head Consul									
	1	SS	14"	М	38	E	FILL: Black COAL with Gravel, Wood, Concrete									
			X	W		- - - - 5 -	Tan to Gray Fine to Medium SAND, Trace Silt and Clay									
•						-										
	_					E										
7	3	SS	X	_W	25	- - - -	Black Fine to Medium SAND, Trace Silt & Clay, Trace Fine to Medium Gravel Very Strong Tar Like Odor									
Ì						E										
	4	SS	X_	W	26	F-15-			·							
•																
ł	 5	SS	J	W	20	<u> </u>										
ŀ	_2_	33		W_	120	- 20 -										
+	6	SS	X	W	22	± - 25-										
						E										
						E	GRAVEL Some Fine to Coarse Sand									
	7	\$\$	15"	M	31	<u> </u>	*	1								
						-	End Boring at 30'									
						E										
				-	-	35-	* Black SILT & CLAY, Some to Little Sand Little to Trace Gravel									
		+	 	+-	1	-										
				1	<u> </u>	± 40·	1	<u> </u>			1					
•	WATER LEVEL OBSERVATIONS								ENER							
	While Drilling Upon Completion of Drilling Time After Drilling							Start 6/9/80 Complet 6/9/80 St. Denn's 750 Crew Chief Rig 750 Drilling Method								
	Depth to Water Hollow Stem Auger															
1	. De	Depth to Cave In														

ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Waukegan, Illinois

Boring No	B38
Surface Elevation	
Job No. C 9177	,
chast 1	٦

_1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848.

(s	ΑM	PL	E		VISUAL CLASSIFICATION		SOIL PROPERTIES						
		Reco	very	Mois	ture	,	and Remarks	Qu	w	u	PL	D			
	No.	Type	+	+	N	Depth		,,,	"	11	r.				
-	1	SS	Х	М	20	+1+1+	FILL: Black Coal, Trace Gravel FILL: Black Very Fine to Medium SAND,								
-	2	SS	X	W	6	5-	Many large Chunks Concrete Sand								
-						۲۲٬۲۲۱ ۱	Black Fine to Medium SAND, Trace Silt								
-	3	SS	χ	W	12	<u>-</u> 10-	and Clav (Note: Sand Saturated with Tar Like Material)								
	4	SS	X	W	28						-				
~ ,	-	ىد	^	71	20	- - - -									
-	5	SS	X	W	30	<u>-</u> - - - 20 -	Black Very Fine SAND, Some Silt and Clay								
-							(Saturated with Tar Like Material)								
- -	6	ss	Х	W	22	25-									
	7	SS	6" 12"	W	23 89	+	Black Fine to Coarse SAND, Some Gravel								
-	<u> </u>	33	, <u>, , , , , , , , , , , , , , , , , , </u>	11	63		End Boring at 30'								
-						- - - 35-	<pre>* Gray SILT, Some to Little Sand & Clay, Little to Trace Gravel</pre>								
-															
-						40-									
	WATER LEVEL OBSERVATIONS					GE	NER	ALI	TON	ES					
-	While Drilling Star6/10/80cpmplet& St. Denn's Crew Chief Rig Time After Drilling Drilling Method				• • • • • • • · ·										
	Depth to Water Hollow Stem Auger														



WARZYN | LOG OF TEST BORING |

Project	Subsurface Investigation
	Outboard Marine Corporation
Location	Waukegan, Illinois

Boring No.	339
Surface Elevation	
Job No. C 9177	
Sheet of]

_1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848

٠ (S	AM	PL	E		VISUAL CLASSIFICATION and Remarks		SOIL PROPERTIES						
-		Reco	very	Mois	ture										
Į	No.	Туре	1	 	N	Depth	· · · · · · · · · · · · · · · · · · ·	- Đu	W	LL	PL	D			
_						E									
_	1	SS	X	M	12	 -	COAL .			1					
						F									
-	2	SS	X	W	13	E 5 -	Brown Fine to Coarse SAND, Some to Little Fine to Coarse Gravel, Trace Silt & Clay								
		ļ				<u> </u>	in the to course draver, made still a dray								
_ :		 				<u> </u>		†							
		 			-	E	Dark Gray Very Fine to Fine SAND, Trace								
	3_	1 55	14"	W	23	10-	Silt & Clay	-							
<u>;</u> -						E		4							
: L.						E									
	4	SS	X	W	34	F	Black Very Fine to Fine SAND, Some to								
 		1				上15-	Trace Silt & Clay								
•					1	Ė				[[
		<u> </u>			<u> </u>	F		ļ							
-	5	SS	X	W	34	E20-									
_				İ											
						F									
_		-	-	 -	-	E		 							
-	_6_	SS	X	W	41	25 –		 							
		1	}			E	*	}			}				
-	7	SS	X	M	38	E	Gray SILT, Some to Little Sand & Clay, Little to Trace Gravel								
ر ا						F	End Boring at 29'	-							
				<u> </u>		= 30-									
_						F	Note: Sample 4 & 5 had a Strong Odor,								
-		┼			-	E	Similar to Tar								
						F35-	1	 	<u> </u>						
_			Ì			F	* GRAVEL, Some Fine to Coarse Sand								
						E		1							
		+	-	-		E					-				
_		+		 		[40 -									
` (WATER LEVEL (/AT	ER	LEVEL OBSERVATIONS	GE	NER	AL	TON	ES				
<u> </u>	While Drilling Sta 6/9/80 Complete 6/9					5/9/80									
	Upon Completion of Drilling Crew Chief Rig						750								
	Time After Drilling Drilling Method														
-	Depth to Water Hollow Stem Auger														
	Depth to Cave in														

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. SB-1	
Surface Elevation 584.9	
JOB NO. C 9177	
Sneet of]	

_1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848.

(SAN	1PL	E		VISUAL CLASSIFICATION		SOIL PROPERTIES						
		Recovery	Moi	sture		and Remarks	Qu	w		01				
	No.	Type +	+	N	Depth			W	LL	PL	D			
- [55,72"	M	172	7	*	ļ		!					
	2	SS X	M	30		Tan to Black Fine to Medium SAND								
-	3	SSX	 	22	<u>-</u> 5-	Brown Medium to Coarse SAND, Trace Fine to Coarse Gravel	ļ							
上	_ <u>*</u> _		1		E	End Boring at 6'								
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-			1		— ——10—									
-				}	E		1	}			•			
						* FILL: Brown & Black Fine to Coarse SAND, Trace Silt & Clay, Trace								
-				<u> </u>	15-	Fine to Coarse Sand								
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_	WATER LEVEL OBSERVATIONS													
- 1	While Drilling Stand Stand				t. Den	Com	plete oic 7	, <u>30, 0</u> 0 50						
	White Drilling Star 5/30/80 Complete/3 Upon Completion of Drilling Drilling Method													
.		Depth to Water												
1	Denth to Cave In													

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. SB-2
Surface Elevation 584.9
Job No. C 9177
Sheet 1 of 1

.1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848

	SAMPLE			E		VISUAL CLASSIFICATION	so	IL P	ROP	ERT	IES
	Recovery Moisture			and Remarks							
No.	Type	ļ	↓	N	Depth		Đu	W	LL	PL	D
1		Χ	M	22		FILL: Brown Fine to Coarse SAND, Trace Fine to Coarse Gravel	-		'		
					E						
2	55	X	W	20	 	Brown Fine to Medium SAND, Trace Silt and Clay			<u> </u>	-	
					፟ -	Gray Fine to Coarse SAND, Trace Fine to					
3	SS	14"	W	10	<u>+</u> > -	Coarse Gravel					
					E	End Boring at 6'					
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٠	WATER LEVEL OBSERVATIONS				+	NER					
W	White Drilling 23½"					Star	5/3 <u>0</u> /8	0 Com	plete/	30/80	
	Upon Completion of Drilling				Sta 5/30/80 Complet 5/30/80 St. Dennis 750 Crew Chief Rig 750						
	Time After Drilling						Drilling Method				
De	pth t	o Wa	ster	•			Hollow Stem Auger				· · · · · · · · · · · · · · · · · · ·
Depth to Cave In											

	LOG OF TEST BORING	Soring No
	OG OF TEST BURN	Surface Elevation
N	Subsurface Investigation Outboard Marine Corporation Outboard Marine Subsurface Illinois	Job No 1 of
1	Subsurfue Marine Corporation	Sheet or
3	Univegan, Illinois	
,	Subsurface Investigation Project Outboard Marine Corporation Waukegan, Illinois Location Waukegan, MADISON, WIS 53715 • TEL (608)	257-48-0
INC	BOX 953B, MADISON, WIS.	SOIL PROPERTIES
109 EMIL	Waukegan, ITTTHUTS Location	
	T CI ASSIFICA	qu W LL PL 0
Ξ	VISUAL CERTAINS and Remarks	
A		
Tu De	FILL: Firm Brown Very Fine to Coarse SAND, Trace Organic Material, Some	
- K 100	FILL: Firm Brown Very Fine to Coarse SAND, Trace Organic Material, Some to Little Silt, Gravel and Clay	
+==	FILL: SAND, Trace Organicavel and Clay	
1 28	to Little Silv	
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W12	End Boring at 6'	
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		NOTES
1		GENERAL NOTES
	TIONS	
	TO LEVEL OBSERVATION	GENERAL GENERAL Start 6/5/80 complete 6/5/80 Denn's 750 Crew Chief Rig
	WATER LEVEL OBSERVATIONS	_ Clear
	18"	Drilling Method Auger
rile Dril	npletion of Drilling	
	er Drilling	
me Aft epth to	Water	
epth to	Cave In	
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Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No	SB-4
Surface Elevati	
JOB NO. C 91	<i>{ </i>
Sheet	of]

5	AM	PL	E		VISUAL CLASSIFICATION		SOIL PROPERTIES					
ec	overy	Mois			and Remarks	Qu	W	ll.	PL	D		
pe		+		Depth					'			
2_	8"	M	10	-	Dark Gray CINDERS & SAND, Trace Gravel	†		 				
	117"	W		E	, , , , , , , , , , , , , , , , , , ,			-				
3.2	1	, W	-3-	F.	Gray Very Fine to Medium SAND, Trace Silt							
22	1,3,,	W	28	于 5 -	and Clay, Occasional Fibrous Material							
	, ,			<u></u>	End Boring at 6'							
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1	11			<u> </u>		-		-		····		
				E								
				E	* FILL: Brown SAND & GRAVEL							
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		<u> </u>	VA.		LEVEL OBSERVATIONS	G	NEF	RAL	NOT	res		
A/bita !	E/20/00						/30/80					
	Vhile Drilling Start3/30/ @Complete/.30/ Upon Completion of Drilling Crew ChiefJWG Rig. (55											
Time A				1 ho	ur	Drill	ing Me	thod				
Depth	to W			1'2"		Hol	low S	tem A	uger .			
	_	- 1-	`					•••••		·····)		



Project	Subsurface Investigation
	Outboard Marine Corporation
	Waukegan, Illinois

Boring No. SB-5
Surface Elevation 586,4
JOB NO. C 9177
Sneet

.1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848.

1		s	AM	IPL	E		VISUAL CLASSIFICATION	so	IL PF	ROP	ERT	TIES
-	No.	Reco	very	Mois	ture	Depth	and Remarks	Qu	w	LL	PL	D
_	1		Χ	М	7	<u> </u>	CINDERS, Trace Silt, Sand and Clay					
						<u>-</u>		<u> </u>	ļ			, .
ŀ	_2_	SS	X	W	2	E	MARL, Wood Chips & Sand	ļ ———	 -	-		
_	3	SS	X	W	10	- 5 —		ļ	;			 -
						E	End Boring at 6'					
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, I		<u>'</u>		W	/AT	ER	LEVEL OBSERVATIONS	GE	NER	AL I	TOV	ES
7	WH	ile Di	rilling						t 6/5/8			
						Drilling			v Chief			
_		ne Af pth to			9 -	<u>ኔ hoi</u> 2'	<u> </u>	Drilli Ho	ng Meti 11ow S1	nod em A	uger	
		pth to										



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LOG OF TEST BORING

Project	Subsurface Investigation
_,	Outboard Marine Corporation
Location	Waukegan, Illinois

Boring No	MW-	1
Surface Ele		_
Job No	9177	
Sheet] of	1

__1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848_

SAMPLE				E		VISUAL CLASSIFICATION	SOIL PROPERTIES							
Recovery Moisture		,	and Remarks	q.	w	l u	PL	D						
No.	Type	+	+	N	Depth									
٦.		י4 יו	M	13	Ē	Light Con. & Boom Vanu Fine to Fine CAND	 	 	 	 	 			
	33	1 4		13	<u> </u>	Light Gray & Brown Very Fine to Fine SAND, Trace Silt and Clay				1				
2	SS	8"_	W	24	<u> </u>				<u> </u>		ļ			
					E		-	 	 -	 	 			
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3	<u>\$</u> \$	10"	W	34	E10-			ļ	ļ	<u> </u>	ļ			
					E	End Boring at 10'								
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					E 40-					-				
			W	TA	ER	LEVEL OBSERVATIONS	GE	NER	AL	100	res			
While Drilling						Star	\$/20/8	OCon	nplete	/20/8				
Upon Completion of Drilling Time After Drilling ½ ho					Drilling 날 hoi		1	w Chief						
Depth to Water 2'5"							Hol	low St	em A	uger				
Depth to Cave In									•••••					

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. MW-2 Surface Elevation 583,4 Job No. C 9177 Sheet 1 of 1

.1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS, 53715 + TEL. (608) 257-4848.

SAMPLE						VISUAL CLASSIFICATION	so	IL PF	ROP	ERT	IES
		very	Mo	sture		and Remarks	Qu	w	ll	PL	٥
No.	Type	†	*	N	Depth						
			<u> </u>	+						<u> </u>	
			<u> </u>			See MW-1 for Classification of O' to 10'					
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					F	Gray Very Fine to Fine SAND, Trace Silt &					
	'				E	Clay, Trace Gravel, Occasional Coarse Sand					
1	55	10"	W	30	<u>-</u>	Layers			ļ	 	
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					E	End Boring at 15'					
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		<u> </u>		1		1 LEVEL OBSERVATIONS	CE	NER	^1	NOT	
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	ne A				1 ho	ur	Ĺ	ng Met			
	pth t			-	2'6"	±	Ho1	low St	em A	uger	
De	pth t	o Ca	ve l	n							

LOG OF TEST BORING

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LOG '	OF TEST	gation
	Subsurface Investi Outboard Marine Co Waukegan, Illinois	rporation
project	Outboard Marine Co Waukegan, Illinois	11.4.*****
	Waukegan, 11111101	2
ocation		TEL

	;4M-3
Boring No	583.4 9177
Surface Eleva	9177
Job No	of
Sneet	

SAMPLE VISUAL CLASSIFICATION and Remarks SOIL PROPERTIES Recovery Multivir In Depth See Mi-1 & 2 for Classification for 0 to 15: Light Gray Very Fine to Fine SAND, Trace Silt & Clay, Occasional Grave) Coarse Sand Layers Light Gray Very Fine to Fine SAND, Trace Experimental Soil And Soil A		Waukegan, Illinois Location Waukegan, Wis 53715 • TEL (608)	257-46	848				1		
Recovery Musture and Remarks See MW-1 & 2 for Classification for 0' to 15' See MW-1 & 2 for Classification for 0' to 15' Light Gray Very Fine to Fine SAND, Trace Sit à Clay, Occasional Gravel Coarse Sand Layers Light Gray Very Fine to Fine SAND, Trace Sit à Clay, Occasional Gravel Coarse Sand Sand Layers End Boring at 25' End Boring at 25' WATER LEVEL OBSERVATIONS Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 complete S/2/8 Sign' 27/80 Complete S/2	INEERING INC	LOCATION	SOIL	L PR	OPE	RTI	ES	1	•	
Recovery Maisture The position of the posit	SAMPLE	CLASSIFICATE	1 1		l 1					
- Completion 1. hour	Recovery Moisture Ye N Depth	See MW-1 & 2 for Classification for 0' to 15' Light Gray Very Fine to Fine SAND, Translate Clay, Occasional Gravel Coarse Layers End Boring at 25' WATER LEVEL OBSERVATIONS Stion of Drilling Light Gray Very Fine to Fine SAND, Translate Coarse Layers End Boring at 25' WATER LEVEL OBSERVATIONS			GE		ef JWG	Plete	5-1	1
Time After Drilling 2'6"± Depth to Water	Time After D	2.6 1								_

LOG OF TEST BORING

Project	Subsurface Investigation
-	Outboard Marine Corporation
	Waukegan, Illinois

Boring No	MW-4	
Surface Elev	ration	583.1
JOB No C	9177	
Sheet 1	of	1

____1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848_

SAMPLE						VISUAL CLASSIFICATION	so	IL PF	ROP	ERT	IES
No	Type	very	Mois		Depth	and Remarks	Qu	w	u	PL	D
1.00	1		!	"	-	Brown & Black Fine to Medium SAND, Trace		 	!		
1	SS	χ	М	10	E	Organic Material, Some to Little Silt & Clay					
					E	Black Very Fine to Fine SAND, Some to					
2	SS	X	W	12	<u> </u>	Little Silt and Clay					
					Ē				 		
					F						
3	SS	χ	W	12	上 ₁₀ _						
					E	End Boring at 10'					
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 	1	1	\ \	/AT	-	LEVEL OBSERVATIONS	GE	NER	AL	TON	ES
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1				of I	Drilling		Crev	v Chief	nn1\$ F	?ig	750
l l	me A			9 .			Drilli	ing Met	hod .		
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	epth t	OCB	A6 10	•						• • • • • • •	· <i>)</i>

LOG OF TEST BORING	Boring No
ZYIN Subsuited Marine Corporation	Sheett.
Location	SOIL PROPERTIES
MPLE VISUAL CLASSIFICATION and Remarks	qu W LL PL D
very Moisture N Depth Norw Fine to F	ine
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3 + 1 + 1 + 1 + 10'	
\$3 F F	
15-	
20-	
<u>E</u> 25-	
30-	
35-	GENERAL NOTES
WATER LEVEL OBSERVAT	Start 5/20/88 omplete 55-1
WATER LEVE	Crew Chief Drilling Method Hollow Stem Auger

While Drilling ___

Time After Drilling nenth to Water

Upon Completion of Drilling.

hour

LOG OF TEST BORING

Project Subsurface Investigation Outboard Marine Corporation Location Waukegan, Illinois

Boring No. MW	-6
Surface Elevation	
JOB NO. C 9177	
Sheet of .	1

	S	AM	PL	 Е		VISUAL OF ACCIDIOATION	SOIL PROPERTI				SOIL PROPER	SOIL PROPERTIE				IES
	Reco	very	Mois	ture		VISUAL CLASSIFICATION										
No.	Type	ţ	+		Depth	and Remarks	Q.	W	LL	PL	D					
1	SS	χ	М	6	1	Tan Fine to Medium SAND, Little to Trace Silt and Clay, Trace Fine to Medium Gravel										
2	SS	X	W	26	 5	Streaked Black to Gray Very Fine to Medium										
3	SS	χ	W	36	<u> </u>	SAND, Trace Organic Material, Some to										
					10-110-115-115-115-115-115-115-115-115-1	End Boring at 11'										
					35-											
			M	/A ⁻	TER	LEVEL OBSERVATIONS	GE	NER	AL	NOT	res					
Up Tir	While Drilling				Drilli	5/21/8 t. Der w Chief ing Met low St	thod .									

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. MW-7
Surface Elevation 584.5
Job No. C. 9177
Sheet of 1

-1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848

SAMPLE						VISUAL CLASSIFICATION	SOIL PROPERTIES						
		very	Moisture		10	and Remarks	Qu	w	LL	PL	D		
NC.	Type	•	-	N	Depth	3" Asphalt			 	<u> </u>			
1	SS	X	W	14		FILL: Brown Very Fine to Coarse SAND, Trace Silt & Clay, Trace Gravel							
2	SS	11"	W	28	5 —	Brown Very Fine to Medium SAND, Trace Silt & Clay, Trace Gravel							
3	SS	9"	W	36									
	33			30	<u> -</u> - - -	End Boring at 10'							
					[15								
					البليل								
					20-	·			<u> </u>				
					25 - - - -								
					E 30 -								
	-			_	14141								
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		· -			F- 40-								
			M	/A7	ΓER	LEVEL OBSERVATIONS	GE	NER	AL	TON	ES		
While Drilling Start 5/23/86 omp Upon Completion of Drilling Crew Chief JWG R Time After Drilling ½ hour Drilling Method Hollow Stem Au				?i o	55								



Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No	SC-1
Surface Elevation	
Job No. C 917	7
Sheet 1 c	e l

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SAMPLE	VISUAL CLASSIFICATION	SOIL PROPERTIES							
Recovery Moisture	:-4								
No. Type + N Depth	and Remarks		W	IL	PL	D			
1&2 SS X W		-	}	<u>:</u> 	!				
384 SS X W -	Black Very Fine to Fine SAND, Some to								
15&6 SS X W	Little Silt and Clay, Trace Organic Material			1					
788 SS X W 5 -	inater rai								
1 % P SS X W									
	End Boring at 6'	<u></u>							
F10-									
		1		<u> </u>					
		1							
		-		<u> </u>					
15-		-		<u> </u>					
20									
									
25-	-								
30	1	 							
		 	ļ						
35									
									
40									
WATER	LEVEL OBSERVATIONS	GE	NER	AL	NOT	ES			
While Drilling 12" Above									
Upon Completion of Drilling)	Crev	St. De: v Chief	nnis' r	Qi	750			
ſ		Star5/27/80 Complete 5/27/8 St. Dennis 750 Crew Chief Rig							
	_			Continuous Split Spoon					
Denth to Cave In		Samp	o1e	_		/			

4



LOG OF TEST BORING

Project	Subsurface Investigation
•	Outboard Marine Corporation
	Waukegan, Illinois

Boring No	SC-2
	tion
Job No. C 9	177
Sheet	of]

__1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (606) 257-4848.

SAMPLE						VISUAL CLASSIFICATION	SOIL PROPERTIES							
Recovery Moisture			and Remarks	Q u	w	ıı	PL							
No.	Type	+	+	N	Depth			77	11	PL	D			
1/2			W_		-	Black Very Fine to Fine SAND, Some to								
3/4			W		<u> </u>	Little Silt and Clay, Trace Organic Material		ļ	<u> </u>					
5/6			W 1.1		E	Material			 		~ ~			
3/18	<u> </u>		ដ		<u> </u>			ļ						
			W		F	End Boring at 6'	 							
·					<u></u>	End bot my at t			<u> </u>					
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					E 10-	Pushed 2" ID Stainless Steel Pipe	-				 _			
,					_	to take Samples								
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		-:11:					Star	5/28/	88	Diete	5/28/8			
		_)	Start 5/28/80 omplete 5/28/80 St. Dennis 750 Crew Chief							
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ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. SC-3
Surface Elevation C 9177
Job No 6 91//
Sheet of]

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848-

SAMPLE					VISUAL CLASSIFICATION	SOIL PROPERTIES							
Recovery Moisture			ture		and Remarks	Qu	w	u	PL	а			
No. Type	*	*	N	Depth	1	7	, "	1		J.			
1/2		W	1	<u> </u>	Black Very Fine to Fine SAND, Some to Little Silt and Clay, Some Organic Material		ļ	+		 			
3/4		W	 				ļ	 	1				
5/6 7/8 9/10		W	:	<u> </u>		 -	 						
1712		W	 	<u> </u>									
				E	End Boring at 6'								
				F			ļ	ļ					
				F10-	Note: Sample 1 Split into Samples 1A & 1B	ļ		ļ	ļ				
								{					
				E	Pushed Stainless Steel 2" ID Pipe to Take Samples	•	}		[
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•					LEVEL OBSERVATIONS	 	NER						
While D						Start5/27/80 complete5/27/80 Crew Chief Rig750							
Time After Drilling						Drilling Method							
Depth t	o W	eter						• • • • • • • • • • • • • • • • • • • •	······				
Depth t	o Ca	ive Ir	١					• • • • • • • • • • • • • • • • • • • •					



Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. SC-4
Surface Elevation
Job No
Sheet of

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848.

SAMPLE					VISUAL CLASSIFICATION	so	L PF	ROP	ERT	IES
Recovery Moisture			ture		and Remarks			Ţ		
No. Type	+	T	ĸ	Depth	2.72 / 1317/ai 113	Q u	W	IL	PL	D
72:		W		E	*					
4/5		W		-	Black Fine to Medium SAND, Some to Little					
	•	W			Silt and Clay, Trace Gravel & Organic					
/7 /n		X XX		Ε.	Material					
/13		W		- 5 —	Gray Very Fine SAND Some Organic Material					
				Ē	End Boring at 6'					
				_	* Black Very Fine SAND, Some Silt, Some to Little Organic Material					<u> </u>
				F,,				1		
				10-				 		
				E	Note 3" Gap 6" to 9"			1	}	
			}	E	'			}	-1	
				E	Pushed Stainless Steel 2" ID Pipe to Take			 		
				- 15-	Samples					
				F				1		
				E					1 1	
	-			<u>†</u>						
	 -			[20 -					-	
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				E40-		<u></u>		<u> </u>		
	_			<u> </u>	I EVEL OBCEDVATIONS	- CF	'A 15" FO	1	1.07	
WATER LEVEL OBSERVATIONS					GENERAL NOTES					
While Drilling 9" Above					Start 5/27/80 pmplete 5/27/8					
Upon Completion of Drilling						Crew Chief Rig 750				
Time Af	ter C	Orillin	Q .				ng Met			
Depth to										

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	1916W - July
	White Drilling Upon Completion of Drilling
/	WATERE
Crew - Method	LIZERO TANALLE CORRECTION OF THE CORRECTION OF T
Start Denn's Rio	WATER LEVEL OBSERVATIONS
GENERAL NO:	
GENERAL NOTES	-sc
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	saldmes +
	Jans ssaluiers bansura]
	Pushed Stainless Steel 2" ID Pipe to Take
	T 3761
	10 12 bas 1112 A Waterias at 61 W
	W + Black Fine Clay, Trace Grace
	Some to Little SAND, Some to Medium SAND, Some to W
	Moisture Some to Little Organic Material Some to Little Organic Material Some to Little Medium SAND, Some to Little Medium SAND, Some to Little White and Clay, Trace Gravel & Organic White Some to Little Some to Little Some to Little White Some to Little Some to Little Some to Little White Some to Little Some to Little
	Sile amos and amos and amos
	WPLE VISUAL CLASS AND Remarks AND MALE AND Clay
	SALES CLASSING
18 18 17	MOITASIER STREET P.O. BOX 9828 MAG ING WAS BONING WAS BOAL WOLLD AND AND AND AND AND AND AND AND AND AN
DEERTIES	Location Was Sale MADISON, WIS, SSI
SAITES	Subsurface Investigation Job No. Box 9538. MADISON. WIS. 53715 . TEL. (608) 257-4848 LOCATION MAUKEGAN. WIS. 53715 . TEL. (608) 257-4848 LOCATION MAUKEGAN. WIS. 53715 . TEL. (608) 257-4848 LOCATION MAUKEGAN. WIS. 53715 . TEL. (608) 257-4848 LOCATION MAUKEGAN. WIS. 53715 . TEL. (608) 257-4848 LOCATION MAUKEGAN. WIS. 53715 . TEL. (608) 257-4848
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LOG OF TEST BORING

Project	Subsurface Investigation
-	Outboard Marine Corporation
Location	Waukegan, Illinois

Boring No. SC-6
Surface Elevation
JOD NO. C 9177
Sheet of]

.1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848

SAMPLE			VISUAL CLASSIFICATION	SO	ROP	PERTIES					
Recovery Moisture			and Remarks			Ī					
No.	Type	ļ	\	N	Depth		Q u	W	IL	PL	D
1/2			W.		<u> </u>	Black Very Fine to Fine SAND, Some Silt &			1		
3/4			W		F	Organic Material Gray Fine to Medium SAND, Trace Organic					
5/6			1		-	Gray Fine to Medium SAND, Trace Organic Material, Some Silt and Clay			ļ		
7/8 9/10			W	 	-	Gray Fine to Medium SAND, Trace Silt and					
V12			W		E 3-	Clay					
	1				-	. End Boring at 6'					
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1					-						
				i	- 10-	Pushed Stainless Steel 2" ID Pipe to			†		
					E	Take Samples	}				
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		<u> </u>			E40-				 		
		1	14	/ ^ 7		LEVEL OBSERVATIONS	GF	NER	<u> </u> Δ	ייין אַ	rec
						LLVLL ODOLKYAHONO	 				
While Drilling 8" Above				Star	5/27/ E. Der	nfor	pletë:	76//			
Upon Completion of Drilling				Crew Chief Rig/30							
	ne At			9			Drillin	ng Mei	thod.	• • • • • • • • • • • • • • • • • • • •	• • • • • • •
Der Der	pth t	o Wa	ster						• • • • • • • • • • • • • • • • • • •		

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ENGINEEDING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No	SC-7
Surface Elev	ation
JOD NO C	9177
Sheet	of]

_1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848,

SAN	1PL	E		VISUAL CLASSIFICATION	so	IL PE	ROP	ERT	'IES
Recovery	1		1	and Remarks	Qu	w	lı	PL	D
No. Type	 	N	Depth		ļ		<u> </u>	<u> </u>	
2/3	W	_	E	Very Loose Black MUCK, Some Sand				-	 -
4/5 6/7 8/9	W			Dark Gray Very Fine to Medium SAND, Trace Organic Material and Silt and Clay					
10711	-		E	End Boring at 6'			 		
			F					<u> </u>	
			<u> -</u> 10-						
				Pushed Stainless Steel 2" ID Pipe to Take Samples					
			- - - - - - - -						
	-		E		-				
	 		<u>-</u> 20 -						
	-	-	-						
			25 - 						
			35-						
			1.1.1						
			40-						
	M	/A ⁻	TER	LEVEL OBSERVATIONS	+	NER			
While Drillin	V		Abov Drilling	e	Star	5/29/8 t. Der ~ Chief	30 10 FS T	nplete Rig Tr	/29/8 ipod
Time After		g			Drilli	ing Me	thod .		· · · · · · · · · · · · · · · · · · ·
Depth to W Depth to C		,					• • • • • • • • •		

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VARZYN | LOG OF TEST BORING

Project	Subsurface Investigation
	Outboard Marine Corporation
Location	Waukegan, Illinois

Boring No. SC-8
Surface Elevation
JOD NO. C 9177
Sheetlofl

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848...

SAMPLE			VISUAL CLASSIFICATION	SOIL PROPERTIES							
Recovery	Mois	ture		and Remarks	9.	İ					
ype	1	N	Depth			W	LL	PL	D		
	I W		-	Plack Very Fire to Madin CAND Ton							
	W	<u> </u>	<u> </u>	Black Very Fine to Medium SAND, Trace Organic Material, Trace Fine to Coarse		ļ					
	1 W	-		Gravel	-	 					
	W	-	<u> </u>		-	 					
	 	 	Ė	End Boring at 6'		 		_			
	 		-								
			F.,								
			£10-	·							
t			<u></u>	Pushed Stainless Steel 2" ID Pipe to Take Samples							
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			E 40 -		-						
	·W	/A	TER	LEVEL OBSERVATIONS	GE	NER	AL	TON	ES		
Drillin			Above			5/28/ t: Den					
	_	of	Drilling		Crev	t. Deni v Chief	1115 F	eig J.T.	bod		
After	Drillin	0			. Drilli	ng Met	hod		· · · · • • • • • • • • • • • • • • • •		
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LOG OF TEST BORING

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	Subsurface Investigation Outboard Marine Corporation Waukegan, Illinois
Location	Waukeyaiis

Boring No. SC-9
Boring (Co
Surface Elevation
Job No
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ENGINEERING IN	'	_OCSTION	6) 23,14				
1409	EMIL ST	REET . P.O. BOX 5	501	L PR	OPE	RIII	=3
		VISUAL CLASSIFICATION			1 1	1	o l
SAMPLE		VISUAL CLASSING and Remarks	qu	W	111	PL	
Recovery Moisture		and Remains			<u> </u>	1	
The state of the s		MIICV			1		
o. Type + + H		Very Loose Black MUCK		 	+		
1	上	Void WATER Gray Very Fine to Medium SAND, Little to Gray Very Fine to Medium SAND, Little to		 	1		
2 W		Gray Very Fine to Medium Sant, Electric Gray Very Fine to Medium Sant, Electric Gray Trace Organic		 			
3 W	F.	Trace Sile die		+			
576	5-	Material End Boring at 6'				1	
7/8	E	End Bot 1113	-	+	1		
			\				T
	-		1			1	
	<u> </u>	To nine to Ta	ke		\		
	E	Pushed Stainless Steel 2" ID Pipe to Ta	 	-			
	<u> </u>	Samples	-			1	
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	TE)	15-	1				
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	WA	TER LEVEL OBSERVATIONS		_ St	381.6	Jenn I	pmplet5/29/ RigTr.100
1		20" Above		-10	rew Cl	1167 Nactho	d
While Drilling	٠٥			— P	rilling	NEUR	-
Lucon Comi	pletion	of Drilling		<u> </u>			
Time After	r Drilling			<u> </u>	•		
- Depth to V	Nater			•			
Depth to C	"" عدور						

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project	Subsurface Investigation
0,000	Outboard Marine Corporation
	Waukegan, Illinois

Boring No	SC-	-10
Surface Ele		
JOB NO. C	91//	· • • • • • • • • • • • • • • • • • • •
Sheet	of	1

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848-

SAMPLE			E		VISUAL CLASSIFICATION	SOIL PROPERTIES						
Reco	very	, , , , , , , , , , , , , , , , , , , 			and Remarks	Bu	W	1	D.			
No. Type	1	1	N	Depth		ďя	W	ll	PL	D		
2/3		W		-	Very Loose Black MUCK			-				
4	•	W		-	Gray Very Fine to Medium SAND, Some to			 		·		
/ §	•	W W		<u>-</u> -	Trace Silt and Clay							
/10	1	,		<u>+</u> 5-		ļ		 	-			
/12	+	W		F.	End Boring at 6'			 	1			
	 				the borring at o	ļ		 				
	 	 		+		 		1	1			
	-			-10-	·	 		 -				
	,			E			1					
İ				<u></u>	Note: Sample #1,2, & 3 Water from Top of							
				F	l Muck							
				15-	Pushed Stainless Steel 2" ID Pipe to Take							
1	}	1		F	Samples			}				
		ļ		F			ļ					
		<u> </u>		F 20-								
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WATER LEVEL OBSERVATIONS					GI	ENEF	RAL	NO	TES			
50" Above							5/29/ St. De					
While Drilling						Cre	St. De	ะทหาริ	ripiete Ric T	ripod		
Upon Completion of Drilling							ling Me					
Depth '						- }						
Depth						1						

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project	Subsurface Investigation
	Outboard Marine Corporation
Location	Waukegan, Illinois

Boring No	SC-11B
Surface Elevat	
JOD NO. C 91.	77
Sheet 1	of1

SAMPLE			VISUAL CLASSIFICATION	so	IL PF	ROP	ERT	IES			
Recovery Moisture			and Remarks								
No.	Type	1	Ţ	N	Depth	6" Very Loose Black MUCK	Qu	W	ıı	PL	D
1/2			W		+			<u> </u>	 	+	
/4/5			W		Ė	Water with Suspended SAND, Water Black		1			
/ 43 6/7		_	W		+				i —	1	
6/7 8/9 0/11			W.		Ė	Gray Very Fine to Medium SAND, Little to					
2/13			W		- 5 -	Trace Silt and Clay		<u> </u>	+		
-,,	i				Ē	End Boring at 6'					
			l		+						
-					<u>+</u>	Pushed Stainless Steel 2" ID Pipe to Take		İ	 	1	
					 - 10-	Samples				 	
					E						
					E	Note: SC-11A was attempted, however sample				1	
					<u> </u>	recovery was unacceptable					
			1		15-	,			 		
			1		E						
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	WATER LEVEL OBSERVATIONS				GE	NER	AL	NOT	ES		
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			9		Drilling		Crev	t5/28/ St. D √ Chi e f	enni	Rio Tri	pod
- •	ne A				_		ł .	ng Met			
	pth t			-					••••		
De	pth t	~ C#	ve in	1							

WARZYN

ENGINEERING INC

LOG OF TEST BORING

Project	Subsurface.Investigation	
	Outboard Marine Corporation	
ocation	Waukegan, Illinois	

Boring No SC-12
Surface Elevation
Sheetl ofl

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848_

SAMPLE			Ξ	_	VISUAL CLASSIFICATION	SOIL PROPERTIES							
Reco	very	, , ,		Moisture and Remarks		q.	w	u	PL	מ			
o. Type	+	+	N	Depth		ļ							
/2		W		-	3" Layer COBBLES			 					
/4		W		F	S cayer coobles	†		 					
					Gray Very Fine to Medium SAND	-		 					
/61 /81		W		- 5 –	and very interestant same								
/ 0		W		Ē	End Boring at 6'			1					
				<u> </u>	Dushod Stainland Stanl 28 ID Ding to Take								
				F10-	Pushed Stainless Steel 2" ID Pipe to Take Samples								
				E									
					2 attempts were made to obtain samples								
					11st attempt failed due to pushing cobble		 						
		ļ		15-	♦					<u>-</u>			
				F									
			}	E	* Very Loose Black MUCK, Little to Trace				}				
		 		+	Sand			1					
				20-	-		1	1					
				E									
		l		上			<u> </u>	ļ					
				F 25-	•								
				E		1							
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				F				1					
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		T		F.,	<u>}</u>		<u> </u>		1				
WATER LEVEL OBSERVATIONS						16	ENEF	1 2 2	NO.	TFS			
While Drilling 30" Above						Sta	5/29/ St. De	innis.	nplete	rino			
					0	1	W Chie						
Time A			n g										
Depth t Depth t								· · · · · · · · · · · · · · · · · · ·					



LOG OF TEST BORING |

Project Subsurface Investigation Outboard Marine Corporation Location Waukegan, Illinois Sheet 1 of 1

Boring No	SC-13
Surface Elev	
JOB NO C.	
1	_ 1

___ 1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848

SAMPLE				VISUAL CLASSIFICATION		SOIL PROPERTIES						
Recovery		0.	w									
No. Type	+	N	Depth			W	IL	PL	D			
/2	W		1	Very Loose Black MUCK, Some to Little			!	-				
3/4	W		+1.1	Sand	<u> </u>	ļ	<u> </u>	ļ				
7/6 //8 /10	W			Black Very Fine to Medium SAND, Little to Trace Silt and Clay, Layers of Water			 	 				
/10	l W	ļ	F 5_	tace Site and city, Layers of Rater		<u> </u>		!				
V12	W	 	-	End Boring at 6'	 		 	 				
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		 	10-	Pushed Stainless Steel 2" ID Pipe to Take	 	 -	 					
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WATER LEVEL OBSERVATIONS				GE	NER	AL	NOT	ES				
While Drilling 6" Above				Star \$ / 28 / 80 Complet 5 / 28 / 8								
Upon Completion of Drilling				Crev	w Chief		Rig	. / 50				
Time After		9			Drilli	ing Met	thod .					
Depth to Ca							• • • • • • • •		• • • • • •			

WARZYN

ENGINEERING INC

LOG OF TEST BORING

Project	Subsurface Investigation
	Outboard Marine Corporation
1.0000.00	Waukegan, Illinois

Boring No.	SC-14
Surface Elevation	on
Job No C. 917	7
Sheet	of1

	S	AM	PL	E		VISUAL CLASSIFICATION	so	IL PF	ROP	ERT	IES
Recovery Moisture				ture		and Remarks	Q.	,,,,	Ī	D ,	
	Type	+	+	N	Depth		<u> </u>	W	II	PL	D
V2/3			<u> </u>		+	Black MUCK, Some to Little Silt, Sand				 	<u> </u>
4/5 6/7			W		Ė	and Clay	ļ		-		ļ
ε/ 0/11			W			Dark Gray Very Fine to Medium SAND, Trace					
2/13			_W		_ 5 –	Silt					
					F	End Boring at 6'			ļ		
					<u></u>				<u> </u>		
					 10-	Pushed Stainless Steel 2" ID Pipe to Take				-	
					E	Samples					
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		LEVEL OBSERVATIONS	GENERAL NOTES								
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	ne Af							ing Met			
De	pth to	o Wa	ter					••••••	• • • • • • • •		· · · · · · · · · · · ·



LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Waukegan, Illinois

Boring No. SC-15
Surface Elevation
Job No. C 9177
Sheet of]

_1409 EMIL STREET + P.O. BOX 9536, MADISON, WIS. 53715 + TEL. (608) 257-4848...

SAMPLE			E		VISUAL CLASSIFICATION	SOIL PROPERTIES								
Recov	ery	Mais	ture		and Remarks			1]					
No. Type	+	+	н	Depth	Y control of the cont	άn	W	II	PL	D				
1/2/3		W		E	Black MUCK, Little to Trace Sand									
4/5		W			Black Very Fine to Medium SAND, Some to									
6/7		W		F	Little Silt & Clay, Trace Organic Material			ļ						
18/19		X		<u> </u>	Dark Gray Very Fine to Medium SAND, Trace			<u> </u>						
12/13		W		<u> </u>	to Little Silt and Clay			 						
					End Boring at 6'									
				<u> </u>										
				上 ₁₀₋										
				E"	Pushed Stainless Steel 2" ID Pipe to Take									
				<u>-</u>	Samples									
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		1.4	/ ^ ~		LEVEL OBSERVATIONS	C-	NED	<u> </u>	NOT	<u></u>				
					LEVEL OBSERVATIONS		NER							
While Dri	lling	4	2" /	Above		Stag	5/20/ Den	ou nts ^m	plete ⁷	/28/80				
				Orilling		Crew	v Chief	F	?ig!	/50				
Time Aft			٥.			Drillin	ng Met	hod						
Depth to										· · · · · · · · · · · · · · · · · · ·				
Depth to	Ca	ve in												

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LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. SC-16
Surface Elevation
JOD NO. C 9177
Sheet of 1

_1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848

(S	AM	PL	E		VISUAL CLASSIFICATION	so	L PF	ROP	ERT	IES
- [Reco	very	Mois	ture		and Remarks		44.		<u> </u>	_
ſ	No.	Type	1	+	ĸ	Depth		Q.	W	LL	PL	D
ַ <u>ﻟ</u>	1/2			W		E	Very Loose Black MUCK, Little to Trace Sand					
	3/4		•	W		<u> </u>	Loose Dark Gray Very Fine to Medium SAND.					
	5/6		•	W			Trace Organic Material, Silt & Clay					
-	7/8 9/10 1/12			W		5-	Gray Very Fine to Medium SAND, Trace Silt and Clay		-			 -
ľ	<u> </u>			<u> </u>		-	End Boring at 6'			 		
.			-	ļ			·					
ľ	-					+	Pushed Stainless Steel 2" ID Pipe to					
ŀ						E10-	Obtain Samples			 		
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ſ							LEVEL OBSERVATIONS	GE	NER	AL	TON	ES
,	While Drilling 19" Above		Star	5/29/ t. Den	88 om	plet 5	/29/80					
	Upon Completion of Drilling		Crev	v Chief	F	?ig	. / 50.					
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WARZYN ENGINEERING INC

LOG OF TEST BORING

Project	Subsurface Investigation
-	Outboard Marine Corporation.
Location	Waukegan, Illinois

Boring No. SC-17
Surface Elevation
Job No. C 9177
Sheet] of]

---- 1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848.

SAMPLE		VISUAL CLASSIFICATION	SOIL PROPERTIES							
Recovery	Moisture	and Remarks	Qu	w	ll.	PL	D			
No. Type	+ N De	I				, ,				
V2/3	W	Very Loose Black MUCK, Little to Trace Sand			[
45/6	W				<u> </u>					
7/8/9	W	Dark Gray Very Fine to Medium SAND, Trace	 		ļ		 			
12/13	WI	Silt and Clay	 	ļ						
14/15	W -		 							
 		End Boring at 6'	 							
		•	 		 		<u> </u>			
		p-{ · · · · · · · · · · · · · · · · · · ·	 							
	LE	Pushed Stainless Steel 2" ID Pipe to								
		Obtain Sample								
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	WATE	R LEVEL OBSERVATIONS	GE	NER	AL	10N	res			
While Drilling	14" At	ove	Star	5/29/	80 orr	plete	/29/80			
Upon Comp	_	ng	Cre	t. Den v Chief	n15	?ig	750			
Time After			Drilling Method							
Depth to Wa	eter				•••••					
Depth to Ca	ive in			· · · · · · · · · · · · · · · · · · ·	• • • • • • • • • • • • • • • • • • • •	•••••				



LOG OF TEST BORING

Project	Subsurface Investigation
•	Outboard Marine Corporation
1	Waukegan Illinois

Boring No	SC-18
Surface Elevati	
JOB NO. C 91	77
Sheet	of]

-1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848.

SAMPLE Recovery Moisture			VISUAL CLASSIFICATION	SOIL PROPERTIES						
			and Remarks	Q#	w	LL	PL	0		
No. Type	4	N	Depth		·			'-		
1/2		 	<u>+</u>	Very Loose Black MUCK, Trace to Little			 	i		
5/6		 		Sand			 			
7/8/11			+	Dark Gray Very Fine to Medium SAND, Trace				<u></u>		
2/13/14			- 5 -	to Little Silt and Clay		!				
	1	-	E	End Boring at 6'						
			_				<u> </u>			
			F.,	Pushed Stainless Steel 2" 1D Pipe to						
		1	E	Obtain Samples						
	 		+	Note: Sample #1,2 & 3 each about 8" others						
	 	 	L	- All A- Cll			 			
			F							
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	<u> </u>		F 40-		 -					
	VISUAL CLASSIFICATION and Remarks Very Loose Black MUCK, Trace to Lit Sand Dark Gray Very Fine to Medium SAND, to Little Silt and Clay End Boring at 6' Pushed Stainless Steel 2" ID Pipe t Obtain Samples Note: Sample #1,2 & 3 each about 8 are 4" to 6"		LEVEL OBSERVATIONS	GE	NER	AL	TON	ES		
Upon Comp	g	3" of	Above Drilling		Star	5/28/8 t. Der v Chief ng Met	DCpm nTS	plete Rig	5/28 750	

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ENGINEERING INC

LOG OF TEST BORING

Project Subsurface Investigation
Outboard Marine Corporation
Location Waukegan, Illinois

Boring No. SC-19
Surface Elevation
JOB NO. C 9177
Sheetl ofl

1409 EMIL STREET + P.O. BOX 9538, MADISON, WIS. 53715 + TEL. (608) 257-4848...

SAMPLE Recovery Moisture			E		VISUAL CLASSIFICATION	SOIL PROPERTIES									
			ture		and Remarks	Q=	w	lı	PL	D					
ia. Type	+	¥	N	Depth		1			"						
2/3		W		Ē	Very Loose Black MUCK, Trace Sand	J		1	 						
4/5		W			Water with Suspended SILT & SAND										
6/7: 9/9: 0/11!		W			Black Very Fine to Medium SAND, Trace to			<u> </u>							
ð 13		W		<u> </u>	Little Silt and Clay										
					End Boring at 6'										
				_				 							
				<u> </u>	,			 	· ·						
				-											
				E	Pushed Stainless Steel 2" ID Pipe to Obtain Samples										
				F.,											
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	ì	1	/ A.	<u></u>	LEVEL OBSERVATIONS	GF	NEF	2A1.	רסע	TES					
							~~~~								
While Drilling 34" Above Upon Completion of Drilling					Star	5/28/ t. Der	nis	npletë Ric	7.597.9° 750						
Upon C Time A						1	ing Me								
Depth t						1									
Depth t															

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LOG OF TEST BORING

Project Subsurface Investigation Outboard Marine Corporation Waukegan, Illinois

Boring No.
Boring No
Surface Elevation
Job No
Sheet

INEERING INC	Waukeyall, A. Location Waukeyall, A. Location Waukeyall, A. Location Waukeyall, A. Location Walkeyall, A. Location	3) 257-4	848			
1409 EMIL	TREET . P.O. BOX 9535, W	SOI	L PF	OP	ERT	ES)
SAMPLE Recovery Moisture	VISUAL CLASSIFICATION and Remarks	Qu	w	u	PL	D
ype N Depth		1_		1	-	
W W W W W W W W W W W W W W W W W W W	Loose Black Very Fine to Fine SAND, Trace Organic Material, Trace Silt and Clay		-	+		
	End Boring at 6'	F	+	1		
	* Black MUCK, Some to Little Silt and Clay, Trace Sand					
	Pushed Stainless Steel 2" ID Pipe to Obtain Samples	-				
	E 30-					
					+	
	ATER LEVEL OBSERVATIONS			E 12	0/80	L NOTE
	9" Above		_ c	rew C	nief Meth	Rigod
Upon Completion Time After Drilling	10101		_			
Depth to Water Depth to Cave I						

APPENDIX D

Monitoring Well Construction Details

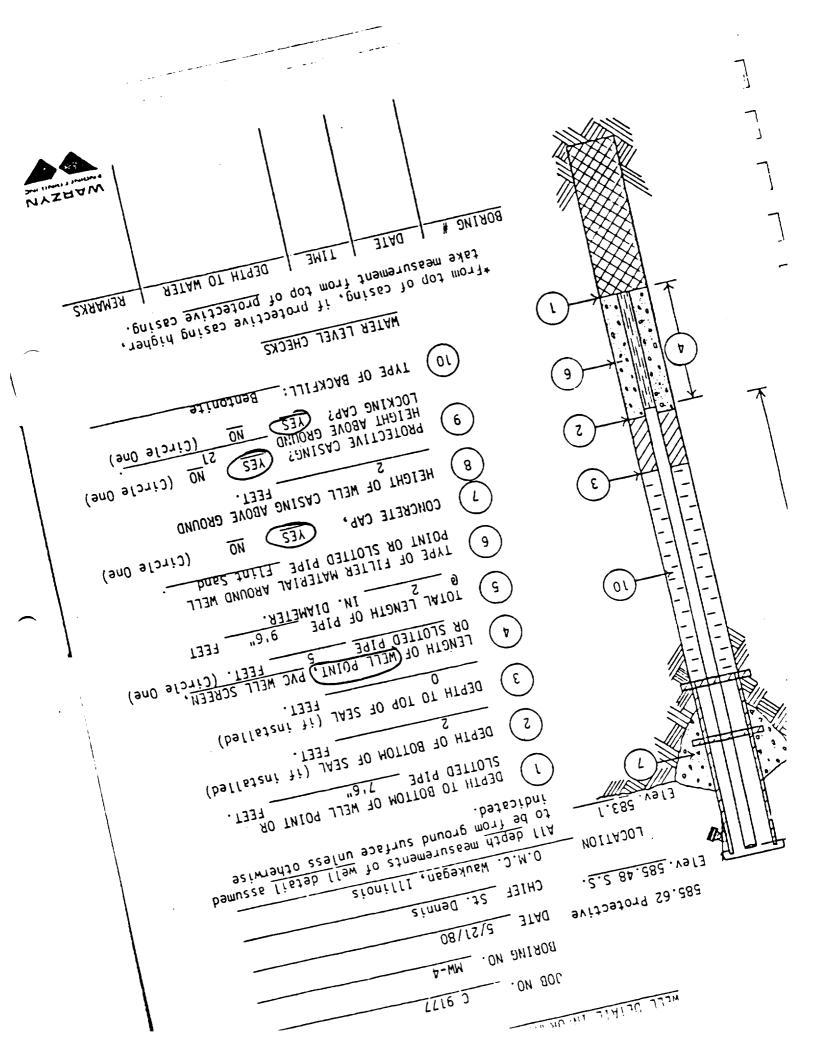


	JO)B NO	C 9177	
	BC	RING NOM	W-1	
585.78 Protective	e DA	TE 5/20/80		
Elev. 585.61 S.S.	CH	HIEF JWG		
LOCATION	0.M.C.	, Wuakegan, I	llinois	
Elev. 583.5	All c	lepth measurem	ments of well detail surface unless other	-
	(1)		OM OF WELL POINT OF	
	2	DEPTH OF BOTT	OM OF SEAL (if inst	talled)
5	3	DEPTH TO TOP	OF SEAL (if instal) FEET.	led)
- - - - - -	4	LENGTH OF WEL	L POINT PVC WELL S	CCREEN, . (Circle One)
	5	TOTAL LENGTH @ 2	OF PIPE 12 IN. DIAMETER.	FEET
	6	TYPE OF FILTE	R MATERIAL AROUND I	METT
3	7	CONCRETE CAP	YES NO	(Circle One)
2	8	HEIGHT OF WEL	L CASING ABOVE GROU	DND
4	9	PROTECTIVE CA HEIGHT ABOVE LOCKING CAP?		(Circle One)
	10	TYPE OF BACK	FILL: Bentonite	
¥ (1)	_	WATER LEVEL	CHECKS	
*From take	top of measur	casing, if p ement from to	rotective casing hi p of <u>protective</u> cas	gher, ing.
BORING #	<u> DA</u>	TE TIME	DEPTH TO WATER	REMARKS
MW-1	5/20)/80 PM	2'6"	from ground
				WARZYN ENGINE COUNT INC

	J	DB NOC 9177
	B	DRING NO. MW-2
586.68 Protect	ive D	ATE
Elev. 586.52 S.S	. CI	HIEF JWG
LOCATION	0.M	.C., Wuakegan, Illinois
8 Elev. 583.4	to b	depth measurements of <u>well detail</u> assumed e from ground surface unless otherwise cated.
	(1)	DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 15'5" FEET.
	2	DEPTH OF BOTTOM OF SEAL (if installed) 12 FEET.
5	3	DEPTH TO TOP OF SEAL (if installed) 11 FEET.
10	4	LENGTH OF WELL POINT, PVC WELL SCREEN, OR SLOTTED PIPE 2'6" FEET. (Circle One)
	5	TOTAL LENGTH OF PIPE 18'6" FEET 0 2 IN. DIAMETER.
	6	TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Natural.
	7	CONCRETE CAP. (Circle One)
2	8	HEIGHT OF WELL CASING ABOVE GROUND 3'1" FEET.
4	9	PROTECTIVE CASING? YES NO (Circle One) HEIGHT ABOVE GROUND 3'2" LOCKING CAP? YES NO (Circle One)
	(10)	TYPE OF BACKFILL: Natural & Bentonite
- 1	\cup	
		WATER LEVEL CHECKS
- *From	n top of e measur	casing, if protective casing higher, rement from top of protective casing.
_ BORING	M DA	TE TIME DEPTH TO WATER REMARKS
- MW-2	5/2	1/80 AM 2'6"± from ground
		WARZYN Minut i muii wa

(

	JOB	NO	9177	
	BORI	NG NO	MW-3	
586.94 Pro	tective DATE	5/21/8	30	
Elev. 586.79	S.S. CHIE	F JWG		
LOCAT	TIONO.M.C	., Wuakega	an, Illinois	
Elev. 583.		rom ground	ments of <u>well deta</u> surface unless oth	
	1 DE SL	PTH TO BOT OTTED PIPE	TOM OF WELL POINT (OR FEET.
	2 DE	PTH OF BOT 24	TOM OF SEAL (if ins	stalled)
5	3 DE	РТН ТО ТОР	OF SEAL (if insta FEET.	lled)
- - - - - - - - - -	4 LE OR		LL POINT PVC WELL TPE 2'6" FEE	SCREEN, I. (Circle One)
	5 70	TAL LENGTH	OF PIPE 29'6" IN. DIAMETER.	_ FEET
	6 TY	PE OF FILT INT OR SLO	ER MATERIAL AROUND	WELL .
3	7 co	NCRETE CAP	, YES NO	(Circle One)
2	(8) HE	IGHT OF WE	LL CASING ABOVE GRO	סאטכ
4	ne ne	OTECTIVE C IGHT ABOVE CKING CAP?		Circle One) 2'7" Circle One)
	10 TY	PE OF BACK	(FILL: Bentonite	
	AW	TER LEVEL	CHECKS	
			protective casing hop of <u>protective</u> ca	
BORIN	NG # DATE	TIME	DEPTH TO WATER	REMARKS
MW MW	5/21/80	PM	2'6"±	from ground
				WARZYN swarrfried inc



-	JOB	NO	C 9177	
	BOR	NG NO	1W-5	
585.27 Pr	otective DATE	5/20/8	30	
Elev. 585	.09 S.S. CHIE	F JWG		-
Loc	CATIONO.M.C			····
Elev. 5.		rom ground	ments of <u>well</u> detai surface unless oth	
	1 DE SL	PTH TO BOT OTTED PIPE	TOM OF WELL POINT O	PR FEET.
	2 DE	PTH OF BOT	TOM OF SEAL (if ins	talled)
5	3 DE		OF SEAL (if instal FEET.	led)
	4 LE	NGTH OF WE	LL POINT PVC WELL IPE 5 FEET	SCREEN, . (Circle One)
	(5) TO	TAL LENGTH	OF PIPE 9 IN. DIAMETER.	•
			ER MATERIAL AROUND TTED PIPE <u>Natural</u>	
3		NCRETE CAP		
2	8 HE		LL CASING ABOVE GRO	UND
4	· · · · · · · · · · · · · · · · · · ·	113111 110016	GROUND 2.1	(Circle One)
		CKING CAP? PE OF BACK		ircle One)
~ <u>+ (1)</u>		re or back	dentante Dentante	
- 💥 🔾	M	TER LEVEL	CHECKS	
 			rotective casing hip of <u>protective</u> cas	
<u>B0</u> 1	RING # DATE	TIME	DEPTH TO WATER	REMARKS
- M	N-5 5/20/80	AM	1.4	from ground
<u>.</u>				WARZYN
	1	1	1	

11-12-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	
	c 9177
	JOB NO
	BORING NO. MW-6
a atortiv	DATE
587.06 Protectiv	CHIEF St. Dennis
Elev. <u>586.98 S.S</u> .	Wallkegan, 1111no13
LOCATION	0.M.C., was rements of well detail otherwise
9 11 N 1 1 12	O.M.C., Waukegan, Illinois All depth measurements of well detail assumed to be from ground surface unless otherwise to be from ground surface unless otherwise
8 Elev. 584.7	to be itom a
	- TOM OF WELL 'S FEET
7)	DEPTH TO BOTTOM OF TO TO SLOTTED PIPE
The state of the s	SLOTTED PIPE
	DEPTH OF BOTTOM OF FEET.
	3) DEPTH TO TOP OF SEAL (if installed) FEET.
1 9-11-10	DEPTH TO TOP OF SEAL FEET.
	3 DELTA SCREEN,
7-11-1	LENGTH OF WELL POINT, PVC WELL SCREEN, OR SLOTTED PIPE OR SLOTTED PIPE THE SCREEN OF COMMENT OF STREET
1-11-1	4 LENGTH OF WELL 5 OR SLOTTED PIPE 12'6" FEET
	72.6
[-1[4 -(10)	OR SLOTTED PIPE 12'6" FEET TOTAL LENGTH OF PIPE 12'6" IN. DIAMETER.
- -	0 WATERIAL AROUND WELL
- -	6 TYPE OF FILTER MATERIAL Flint Sand
	6 TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Flint Sand (Circle One)
	TO THE TENT OF THE
1 1 1 1 × 3	CONCRETE CAP, B HEIGHT OF WELL CASING ABOVE GROUND REET. 10:1020 One)
	8 HEIGHT OF WELL CONFEET. 2'6" FEET.
2	- " (Likele out)
	9 PROTECTIVE CASING? YES 2'7" NO (CITCLE One)
	UE IGHI ADDITE NO
	LOCKING CAP? YES TO BACKFILL: Sand & Bentonite Mix (10) TYPE OF BACKFILL: Sand & Bentonite Mix
- (4)(0)	TYPE OF BACKFILL:
	WATER LEVEL CHECKS
上	*From top of casing, if protective casing higher, *From top of casing, if protective casing. *Asks measurement from top of protective casing.
	*From top of casing, if protective casing mights take measurement from top of protective casing. **TIME DEPTH TO WATER REMARKS
1-	take measurement from top of process take measurement from top of process TIME DEPTH TO WATER REMARKS
L 🚫	PATE TIME DEPTH TO WITTE
	BORING # DATE TIME
	WARZYN
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-	JOB NO. C 9177
	BORING NOMW-7
	DATE5/23/80
	CHIEF JWG
LOCATION(O.M.C., Waukegan, Illinois
Elev. 584.55	all <u>depth</u> measurements of <u>well detail</u> assumed to be from ground surface unless otherwise indicated.
	DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 9'6" FEET.
2	DEPTH OF BOTTOM OF SEAL (if installed) 3 FEET.
5	DEPTH TO TOP OF SEAL (if installed) O FEET.
- 1 - 10 A	LENGTH OF WELL SCREEN, OR SLOTTED PIPE 5 FEET. (Circle One)
	TOTAL LENGTH OF PIPE 12'6" FEET 6 2 IN. DIAMETER.
	TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Natural.
3	CONCRETE CAP, YES NO (Circle One)
2	HEIGHT OF WELL CASING ABOVE GROUND TEET.
4	PROTECTIVE CASING? YES NO (Circle One) HEIGHT ABOVE GROUND 3.1 LOCKING CAP? YES NO (Circle One)
	O TYPE OF BACKFILL: Bentonite
* (1)	WATER LEVEL CHECKS
*From top	p of casing, if protective casing higher, asurement from top of <u>protective</u> casing.
BORING #	DATE TIME DEPTH TO WATER REMARKS
MW-7	5/23/80 AM 3'6"± from ground
	WARZYN

APPENDIX E

Baildown Test Results



BAILDOWN PERMEABILITY TEST GENERAL PROCEDURES

The purpose of a baildown test is to measure the in-situ permeability of subsurface materials. Baildown tests measure the water bearing properties of undisturbed, in-place aquifer material whereas laboratory tests require removal of material from its natural environment. During the collection of samples for laboratory testing, the material is disturbed and a laboratory permeability test may not be representative of actual in-field permeability.

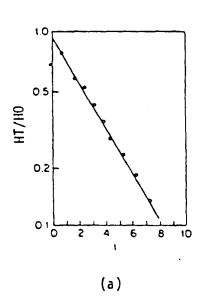
The general procedure for a baildown test is to instantaneously remove water from a well by bailing or pumping and measure the rate at which the water in the well returns to its static level. The rate of water level rise and the physical dimensions of the well (screen length and diameter) are directly related to the permeability of the aquifer material. The greater the permeability, the faster the water in the well will return to the static, pre-test level.

DATA REDUCTION

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The method of interpreting the water level vs. time data that arise from a baildown test is that of Hvorslev (1951)¹, also in NAVFAC (1971)². A plot of field recovery data shows an exponential decline of recovery rate with time. If the recovery is normalized to HT_n (Figure b) and ratios of unrecovered head differences are plotted on a logarithmic scale, a straight line plot results (Figure a). Faster recovery rates are expressed as steeper slopes, implying higher permeability values.

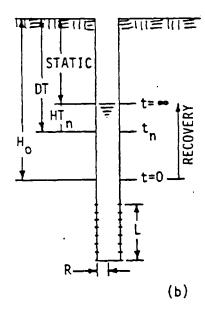




Warzyn Engineering has developed a computer method to efficiently reduce and analyze baildown test field data. Input field data is converted to values which can be used for graphical analysis. A statistical evaluation estimates the fit of data to a theoretical curve.

With a screen shape L/R > 8, the expression for permeability K is:

$$K = \frac{R^2}{2L(t_z-t_i)}$$
 in $\left(\frac{L}{R}\right)$ in $\left(\frac{HT_z}{HT_i}\right)$



Where: R = Radius of well screen

L = Length of well screen

HT_n = Unrecovered head difference at time t_n

STATIC = Measured depth to stabilized water level

DT = Input data (measured depth to water at time t_n)

Time, input as hours, minutes and seconds, is converted to seconds of elapsed time. Measured depth to water at time t_n (DT) is converted to a ratio of head differences (HT/HO), or percent drawdown. These values can be plotted on semi-cycle log paper with time on the abcissa.



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HT/HO
                   BAILDOWN PERMEABILITY TEST RESULTS
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Initial unrecovered head difference
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                   PERMEABILITY = 4.06E-04
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-5.704



If the statistical correlation is good, the slope of the best fit, or least scatter, curve can be used to calculate a permeability value. The correlation coefficient ranges from 0 to -1. A correlation coefficient of -1 indicates a perfect correlation, or no scatter of points around the best fit curve.

Permeability may be evaluated also for various intervals of the recovery data by inputting parametric values of any two selected points. The slope of the line between these points is used to calculate a permeability value.



11

Hvorslev, M.J. 1951, Time Lag and Soil Permeability in Groundwater Observations. U.S. Army Corps Engineers. Waterways Exp. Sta. Bull 36, Vicksburg, Miss.

United States Department of the Navy Design Manual: Soil Mechanics, Foundations, and Earth Structures NAVFAK DM-F, March 1971, page 7-4-9.

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BEST FIT:

PERMEABILITY = 3.53E-03

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APPENDIX F

Chain of Custody Procedures



CHAIN OF CUSTODY PROCEDURES

A pre-drilling briefing was held among drilling personnel and the field coordinator from Warzyn Engineering Inc., to inform all personnel of project objectives, sample locations and Chain of Custody procedures. Brief meetings were also periodically held during and after all Chain of Custody samples were collected to discuss procedures.

The drill crew chief collected all soil samples. Each sample was placed in a 32 ounce wide-mouth jar, aluminum foil was placed over the mouth of the jar before the lid was put on the jar. When a box of sample jars (12) was collected, the box had a numbered seal placed over it. Over the numbered seal, tamper-proof evidence tape was placed to allow detection if the boxes were opened.

All jars were labeled at the time of collection, the labels indicated at a minimum: boring number, sample number, sample depth, and late. The numbered seals were used to corrulate boxes of samples with Chain of Custody forms. Each Chain of Custody form contained a manifest of the samples contained within each numbered box. A Chain of Custody form is attached. All boxes and/or individual samples were maintained in conditions consistent with strict Chain of Custody. The person having custody of the sample, at all times, either maintained physical posession of the sample, kept the sample in view after being in his or her physical possession, or the samples were placed in a suitably locked and secure location.

Periodically the drilling crew chiefs transferred custody of the samples to the field custodian. When tranferring possession of samples, the transferee and the receiver signed and dated the Chain of Custody form.

Weekly the samples were transported to Ral-Tech Scientific Services of Madison, Wisconsin, by the field custodian. These samples were transferred via private vehicle, with strict custody procedures being followed. Immediately upon arrival in Madison, the field custodian igned the samples over to a representative of Ral-Tech.

The above procedure was also followed on all samples preserved for volitile organics by freezing immediately after collection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION V Surveillance and Analysis Division 536 South Clark St. Chicago, Illinois 60605

HAZARDOUS WASTE INVESTIGATION SECTION CHAIN OF CUSTODY RECORD

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION V Surveillance and Analysis Division 536 South Clark St. Chicago, Illinois 60605

CHAIN OF CUSTODY RECORD

CUSTODY SIGNATURES

The persons whose signatures are listed below certify that the collected samples listed in the sample inventory and master packing list above had the samples in their custody and the only manner in which custody was given up was either to one of the other persons listed below or to a locked and/or secured area or chest.

(CONTINUED FROM THE OBVERSE SIDE)

COURIER AND/OR				
COMMERCIAL CARRIER	Signature or Carrier	Sent To		Date and Time (Signed or Dispatched)
HWIS CUSTODIAN COURIER	Signature		Date and	Time
AND/OR COMMERCIAL CARRIER CRL LAB	Signature of Carrier	Sent To		Date and Time (Signed or Dispatched)
CUSTODIAN	Signature		Date and	Time
CRL SECTION CHIEF	Signature		Date and	Time

APPENDIX G

Boring and Monitoring Well Location and Elevations



OMC PLANT
WAUKEGAN, ILLINOIS
Boring and Well Elevations and Locations
C. 9177

			0 31.7.			
Boring or Well No.	Top of Stainless Steel Casing	Top of Protective Metal Casing	Ground Elevation	Baseline Station	Distance Right	Distance Left
MW 1	585.61	585.78	583.5	30+21	40	
MW 2	586.52	586.68	583.4	30+21	40	
MW 3	586.79	586.94	583.4	30+21	40	
MW 4	585.48	585.62	583.1	30+80		120
MW 5	585.09	585.27	583.0	20+50	240	
MW 6	586.98	587.06	584.7	28+99	380	
· MW 7		587.65	584.55 .	20+80	130	
SB 1			584.9	14+60	137	
SB 2			584.9	14+20	136	
SB 3			584.4	6+77	401	
SB 4			584.2	6+21	666	
SB 5			586.4	0+92	261	
	,					

OMC PLANT
WAUKEGAN, ILLINOIS
Boring and Well Elevations and Locations
C 9177

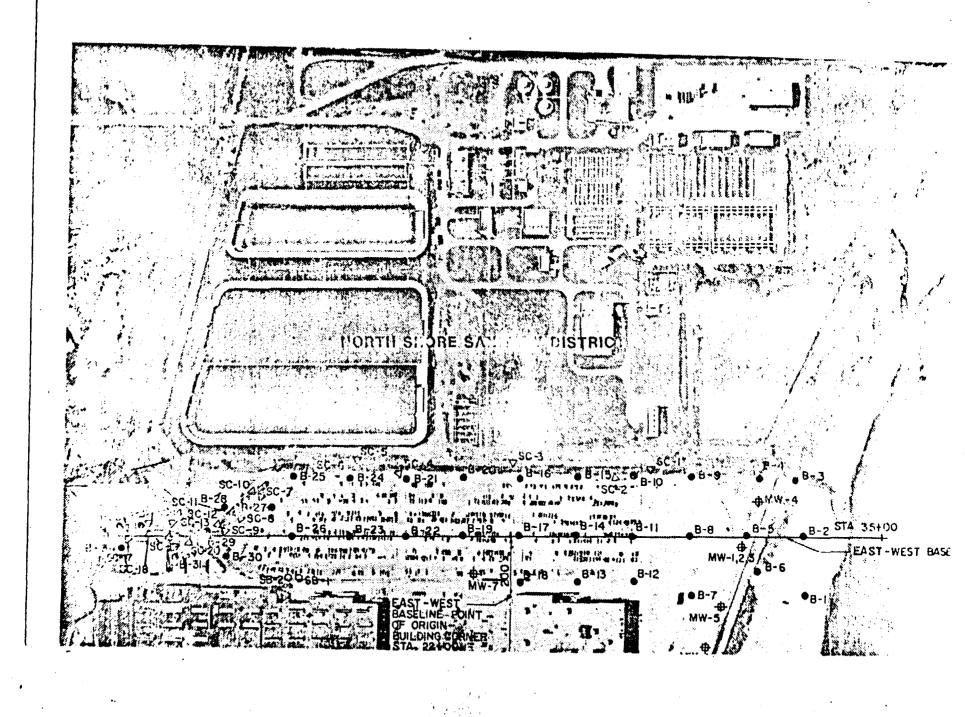
Boring or Well No.	Top of Stainless Steel Casing	Top of Protective Metal Casing	Ground Elevation	Baseline Station	Distance Right	Distance Left
B-1				32+40	200	
B-2				32+40	0	00
B-3			583.2	32+10		195
B-4			582.8	30+80		200
B-5			583.1	30+40	0	0
B-6			584.9	30+74	119	
B-7			584.5	28+40	200	
B-8			585.3	28+40	00	0
B-9			584.2	28+40		205
B-10			583.8	26+34		200
B-11			585.4	26+40	0	0
B-12			585.2	26+40	152	
B-13			585.2	24+39	153	
8-14			584.9	24+40	Ω	0
B-15			583.8	24+44		206
B-16			583.9	22+40		200

OMC PLANT WAUKEGAN, ILLINOIS Boring and Well Elevations and Locations C. 9177

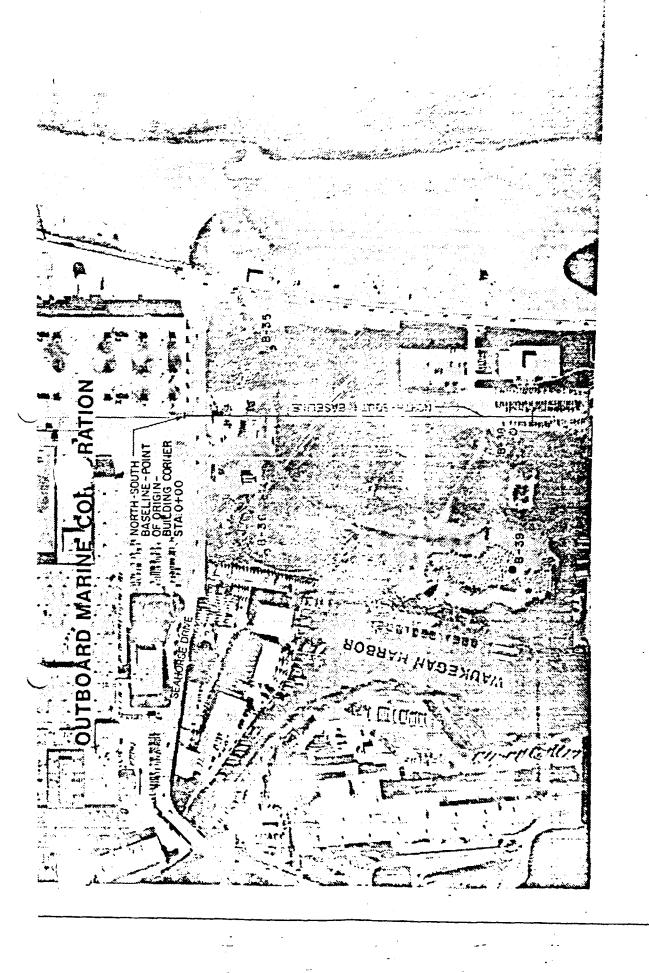
Boring or Well No.	Top of Stainless Steel Casing	Top of Protective Metal Casing	Ground Elevation	Baseline Station	Distance Right	Distanc Left
B-17			584.6	22+40	0	0
B-18			584.7	22+41	158	
B-19			584.4	20+40	0	0
B-20			583.9	20+40		200
B-21			583.8	18+40		200
B-22			584.4	18+40	0	0
В-23			584.4	16+40	0	
B-24			583.9	16+40		202
B-25			583.7	14+40		209
B-26			584.4	14+40	0	0
B-27			584.1	13+40		100
B-28			585.2	12+02		104
B-29			584.8	11+38		20
B-30			585.1	12+05	66	
B-31			584.5	10+30	69	
B-32			584.6 (9+09		45

OMC PLANT WAUKEGAN, ILLINOIS Boring and Well Elevations and Locations C 9177

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Boring or Well No.	Top of Stainless Steel Casing	· Top of Protective Metal Casing	Ground Elevation	Baseline Station	Distance Right	Distanc Left
B-33			585.2	<u>8+33</u>		42
B-34			584.9	8+42	34	
B-35			584.3	* 3+10		240
B-36			585.0	* 2+90	475	
B-37			585.2	* 7+80	250	
B-38			585.5	* 11+40	50	
B-39			584.1	* 11+40	540	
				* Means N-S Bas	eline	
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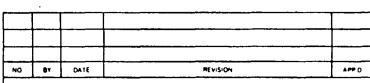
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ASC-10 SEDIMENT CORES





BORING AND MONITORING WELL LOCATION MAP

OUTBOARD MARINE CORPORATION WAUKEGAN ILLINOIS

PREPARED FOR MASON AND HANGER - SILAS MASON COMPANY

EDISON, NEW JERSEY



DRAWNCMP	SCALE 4 . 200'	SHEET OF
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NOTES

- 1. AERIAL PHOTO OBTAINED FROM JRB. ASSOCIATES, MCLEAN, VIRGINIA.
- 2. BORINGS SURVEYED BY WARZYN ENGINEERING INC., JUNE 1980.

 REFER TO APPENDIX "G" OF TEXT FOR EXACT COORDINATE LOCATIONS

 OF BORINGS AND WELLS.
- 3. SHALLOW BORING S8-5 IS BEYOND THE AREA SHOWN BY THIS AERIAL PHOTO.
- 4. AREA SHOWN ON THIS PHOTO INCLUDES PORTIONS OF SECTIONS 15 AND 22, T45N, R23E, LAKE COUNTY, ILLINOIS.
- 5. SCALE IS APPROXIMATE.

LEGEND

.m. MW-7 GROLINDWATER OBSERVATION WELL & MIMBER